

Supplementary Table 3. Cirrhosis enriched species presenting linear discriminant analysis (LDA) compared healthy control

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhoiss groups
Cirrhosis	Bacteroides ovatus group	Species	Bacteria: Bacteroidetes: Bacteroidia: Bacteroidales: Bacteroidaceae: Bacteroides	4.24972	0.01546	0.7798	4.21008
Cirrhosis	Ruminococcus gnavus	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Ruminococcus_g5	3.87858	0.00014	0.11865	1.60791
Cirrhosis	Fusobacterium varium group	Species	Bacteria: Fusobacteria: Fusobacteria_ c: Fusobacteriales: Fusobacteriaceae: Fusobacterium	3.53393	0.0024	0.12711	0.85617
Cirrhosis	Lactobacillus sakei group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.37412	0.0256	0.00245	0.39651
Cirrhosis	Hungatella_uc	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Hungatella	3.33089	0.00201	0.0326	0.5657
Cirrhosis	Clostridium clostridioforme group	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Clostridium_g24	3.29205	0.00042	0.24295	0.58576
Cirrhosis	Flavonifractor plautii	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Ruminococcaceae: Pseudoflavonifractor	3.21895	0.00583	0.14283	0.45614
Cirrhosis	Streptococcus pneumoniae group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Streptococcaceae: Streptococcus	3.1818	0.00093	0.02051	0.27882
Cirrhosis	Clostridium nexile	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Coprococcus_g2	2.89156	0.00367	0.02545	0.179
Cirrhosis	Citrobacter bitternis group	Species	Bacteria: Proteobacteria: Gammaproteobacteria: Enterobacteriales: Enterobacteriaceae: Citrobacter	2.85353	0.04799	0.00023	0.15543
Cirrhosis	Clostridium symbiosum	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Clostridium_g35	2.74834	0.00912	0.04063	0.17252
Cirrhosis	Emergencia timonensis	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Mogibacterium_ f: Emergencia	2.68281	0.04799	0.00009	0.07071

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhoiss groups
Cirrhosis	Anaerotignum lactatifermentans	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Anaerotignum	2.30479	0.00776	0.012	0.04641
Cirrhosis	Robinsoniella peoriensis	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Robinsoniella	2.17807	0.02259	0	0.02788
Cirrhosis	Granulicatella adiacens group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Aerococcaceae: Granulicatella	2.10636	0.01176	0.00665	0.02699
Cirrhosis	Bifidobacterium breve	Species	Bacteria: Actinobacteria: Actinobacteria_ c: Bifidobacteriales: Bifidobacteriaceae: Bifidobacterium	2.0703	0.00022	0.00072	0.02594
Cirrhosis	Pantoea coffeiphila	Species	Bacteria: Proteobacteria: Gammaproteobacteria: Enterobacteriales: Erwiniaceae: Pantoea	2.01392	0.04736	0.00687	0.02809
Non-Varices	Veillonella dispar	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	4.17507	0.00004	1.08723	3.71865
Non-Varices	Veillonella atypica	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	3.80953	0.00335	0.13783	1.334
Non-Varices	Lactobacillus gasseri group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.76202	0.00921	0.00784	1.18072
Non-Varices	Lactobacillus helveticus group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.70829	0.00004	0.00562	1.10015
Non-Varices	Veillonella parvula group	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	3.64978	0.00002	0.27363	1.09708
Non-Varices	Clostridium clostridioforme group	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Clostridium_g24	3.62349	0.00729	0.24295	0.86369
Non-Varices	Streptococcus salivarius group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Streptococcaceae: Streptococcus	3.50998	0.00793	0.14088	0.67489

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhois groups
Non-Varices	Ruminococcus gnavus	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Ruminococcus_g5	3.40466	0.00036	0.11865	0.63648
Non-Varices	Enterococcus faecium group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Enterococcaceae: Enterococcus	3.33875	0.00003	0.01075	0.40898
Non-Varices	Megasphaera micronuciformis	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Megasphaera	3.18056	0.00475	0.01127	0.37211
Non-Varices	Streptococcus pneumoniae group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Streptococcaceae: Streptococcus	3.15122	0.00004	0.02051	0.26064
Non-Varices	Lactobacillus salivarius	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.12482	0.00546	0.02335	0.29707
Non-Varices	Streptococcus sinensis group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Streptococcaceae: Streptococcus	3.1182	0.00076	0.03559	0.28415
Non-Varices	Gemmiger formicilis group	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Ruminococcaceae: Subdoligranulum	3.09113	7.63E-06	0.55361	0.64628
Non-Varices	Clostridium nexile	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Coproccoccus_g2	3.00487	6.97E-06	0.02545	0.22548
Non-Varices	Lactobacillus fermentum	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	2.90418	0.00016	0.00073	0.16538
Non-Varices	Streptococcus parasanguinis group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Streptococcaceae: Streptococcus	2.83012	0.00176	0.03373	0.1449
Non-Varices	Bifidobacterium dentium	Species	Bacteria: Actinobacteria: Actinobacteria_ c: Bifidobacteriales: Bifidobacteriaceae: Bifidobacterium	2.65194	1.62E-06	0.00051	0.12469
Non-Varices	Lactobacillus sakei group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	2.64029	0.00341	0.00245	0.07753

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhoiss groups
Non-Varices	Parabacteroides distasonis	Species	Bacteria: Bacteroidetes: Bacteroidia: Bacteroidales: Porphyromonadaceae: Parabacteroides	2.44557	0.00682	0.11889	0.1328
Non-Varices	Anaeroglobus geminatus	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Megasphaera	2.40303	0.00037	0.00325	0.06761
Non-Varices	Fusobacterium nucleatum group	Species	Bacteria: Fusobacteria: Fusobacteria_ c: Fusobacteriales: Fusobacteriaceae: Fusobacterium	2.27064	0.00537	0.00096	0.04452
Non-Varices	Granulicatella adiacens group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Aerococcaceae: Granulicatella	2.26279	2.03E-06	0.00665	0.0364
Non-Varices	Clostridium perfringens	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Clostridiaceae: Clostridium	2.24458	0.00216	0.00491	0.03757
Non-Varices	Romboutsia sedimentorum	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Peptostreptococcaceae: Romboutsia	2.15992	0.00734	0.00136	0.02959
Non-Varices	Veillonella_uc	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	2.03603	0.00006	0.013	0.03521
Varices	Escherichia coli group	Species	Bacteria: Proteobacteria: Gammaproteobacteria: Enterobacteriales: Enterobacteriaceae: Escherichia	4.54553	0.038	5.97096	12.45608
Varices	Veillonella dispar	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	4.38191	0.00001	1.08723	6.35227
Varices	Veillonella atypica	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	4.14036	0.00131	0.13783	2.78905
Varices	Lactobacillus helveticus group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	4.02113	2.91E-06	0.00562	1.99368
Varices	Enterococcus faecium group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Enterococcaceae: Enterococcus	4.00189	6.16E-07	0.01075	1.60711

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhoiss groups
Varices	Staphylococcus aureus group	Species	Bacteria: Firmicutes: Bacilli: Bacillales: Staphylococcaceae: Staphylococcus	3.95343	0.00822	0.00031	1.67956
Varices	Lactobacillus salivarius	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.86663	5.90E-06	0.02335	1.64973
Varices	Ruminococcus gnavus	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Ruminococcus_g5	3.76452	0.00019	0.11865	1.26662
Varices	Veillonella parvula group	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	3.61098	2.59E-07	0.27363	1.19047
Varices	Lactobacillus fermentum	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.57534	1.30E-06	0.00073	0.74123
Varices	Enterococcus faecalis	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Enterococcaceae: Enterococcus	3.56261	0.00005	0.00063	0.62229
Varices	Streptococcus pneumoniae group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Streptococcaceae: Streptococcus	3.52871	0.00036	0.02051	0.74385
Varices	Lactobacillus gasseri group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.34076	0.00015	0.00784	0.42751
Varices	JH815484_s	Species	Bacteria: Bacteroidetes: Bacteroidia: Bacteroidales: Bacteroidaceae: Bacteroides	3.28519	0.04421	0.00337	0.39377
Varices	Granulicatella adiacens group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Aerococcaceae: Granulicatella	3.25804	0.00017	0.00665	0.32347
Varices	Megasphaera micronuciformis	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Megasphaera	3.23051	0.00007	0.01127	0.32407
Varices	Bacteroides xylanisolvans group	Species	Bacteria: Bacteroidetes: Bacteroidia: Bacteroidales: Bacteroidaceae: Bacteroides	3.21899	0.04234	0.55197	0.81803
Varices	Bacteroides caccae	Species	Bacteria: Bacteroidetes: Bacteroidia: Bacteroidales: Bacteroidaceae: Bacteroides	3.17764	0.00232	0.5895	0.77853

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhoiss groups
Varices	<i>Bifidobacterium breve</i>	Species	Bacteria: Actinobacteria: Actinobacteria_c: Bifidobacteriales: Bifidobacteriaceae: Bifidobacterium	3.15902	0.04134	0.00072	0.26568
Varices	<i>Lactobacillus sakei</i> group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.06799	0.00008	0.00245	0.25362
Varices	<i>Anaerostipes hadrus</i> group	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Anaerostipes	3.06158	1.05E-06	0.16337	0.22287
Varices	<i>Clostridium innocuum</i> group	Species	Bacteria: Firmicutes: Erysipelotrichi: Erysipelotrichales: Erysipelotrichaceae: Longicatena	3.05004	5.00E-07	0.01312	0.23114
Varices	<i>Clostridioides difficile</i> group	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Peptostreptococcaceae: Clostridioides	2.94552	0.00029	0.00019	0.17576
Varices	<i>Clostridium nexile</i>	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Coprococcus_g2	2.91749	0.02857	0.02545	0.16768
Varices	<i>Streptococcus sinensis</i> group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Streptococcaceae: Streptococcus	2.89186	0.04073	0.03559	0.18393
Varices	<i>Rothia mucilaginosa</i> group	Species	Bacteria: Actinobacteria: Actinobacteria_c: Micrococcales: Micrococcaceae: Rothia	2.84983	0.03365	0.0008	0.09987
Varices	<i>Dorea longicatena</i>	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Dorea	2.81416	2.08E-06	0.11671	0.13684
Varices	<i>Clostridium ramosum</i>	Species	Bacteria: Firmicutes: Erysipelotrichi: Erysipelotrichales: Erysipelotrichaceae: Clostridium_g6	2.78609	8.48E-07	0.09493	0.16074
Varices	<i>Clostridium perfringens</i>	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Clostridiaceae: Clostridium	2.78196	0.015	0.00491	0.1407
Varices	<i>Anaeroglobus geminatus</i>	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Megasphaera	2.6649	0.00732	0.00325	0.10853

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhoiss groups
Varices	Fusobacterium nucleatum group	Species	Bacteria: Fusobacteria: Fusobacteria_ c: Fusobacteriales: Fusobacteriaceae: Fusobacterium	2.65499	0.00972	0.00096	0.10522
Varices	Ruthenibacterium lactatiformans	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Ruminococcaceae: Ruthenibacterium	2.57837	0.03373	0.07559	0.13601
Varices	Lactobacillus paracasei group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	2.53487	0.00002	0.00228	0.065
Varices	Prevotella oris	Species	Bacteria: Bacteroidetes: Bacteroidia: Bacteroidales: Prevotellaceae: Prevotella	2.47841	0.01664	0	0.06748
Varices	Weissella confusa group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Leuconostocaceae: Weissella	2.42601	0.03085	0.00547	0.05514
Varices	Dorea formicigenerans	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Dorea	2.42278	0.00002	0.02263	0.0557
Varices	Holdemanella biformis	Species	Bacteria: Firmicutes: Erysipelotrichi: Erysipelotrichales: Erysipelotrichaceae: Holdemanella	2.41616	0.01756	0.07084	0.10805
Varices	Bifidobacterium scardovii	Species	Bacteria: Actinobacteria: Actinobacteria_ c: Bifidobacteriales: Bifidobacteriaceae: Bifidobacterium	2.35491	0.00936	0	0.05056
Varices	Clostridium tertium group	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Clostridiaceae: Clostridium	2.34301	0.01941	0.01324	0.05605
Varices	Hungatella effluvii	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Hungatella	2.15108	0.00992	0.00058	0.03189
Varices	Pseudomonas aeruginosa group	Species	Bacteria: Proteobacteria: Gammaproteobacteria: Pseudomonadales: Pseudomonadaceae: Pseudomonas	2.14459	0.00187	0.00006	0.02368
Varices	Bifidobacterium dentium	Species	Bacteria: Actinobacteria: Actinobacteria_ c: Bifidobacteriales: Bifidobacteriaceae: Bifidobacterium	2.14422	0.00002	0.00051	0.03114

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhois groups
Varices	Ruminococcus lactaris	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Ruminococcus_g4	2.13515	0.00002	0.02653	0.04346
Varices	Abiotrophia defectiva	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Aerococcaceae: Abiotrophia	2.13304	0.01963	0.00013	0.02374
Non-Acites	Enterobacteriaceae group	Species	Bacteria: Proteobacteria: Gammaproteobacteria: Enterobacteriales: Enterobacteriaceae: Enterobacteriaceae_g	4.29873	0.04564	0.8066	4.64614
Non-Acites	Veillonella dispar	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	4.19823	0.00211	1.08723	4.16561
Non-Acites	Veillonella atypica	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	3.63059	0.04516	0.13783	1.002
Non-Acites	Lactobacillus helveticus group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.48606	0.00303	0.00562	0.5367
Non-Acites	Streptococcus pneumoniae group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Streptococcaceae: Streptococcus	3.3947	0.00017	0.02051	0.55881
Non-Acites	Veillonella parvula group	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	3.38926	0.00015	0.27363	0.8279
Non-Acites	Ruminococcus gnavus	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Ruminococcus_g5	3.35823	0.00196	0.11865	0.54061
Non-Acites	Enterococcus faecalis	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Enterococcaceae: Enterococcus	3.33777	0.03643	0.00063	0.43861
Non-Acites	Dialister invisus	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Dialister	3.29236	0.0281	0.34168	0.52871
Non-Acites	Megasphaera micronuciformis	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Megasphaera	3.25883	0.00935	0.01127	0.37565
Non-Acites	Lactobacillus salivarius	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.25765	0.02588	0.02335	0.57405

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhoiss groups
Non-Acites	<i>Bacteroides stercoris</i>	Species	Bacteria: Bacteroidetes: Bacteroidia: Bacteroidales: Bacteroidaceae: Bacteroides	3.2251	0.02693	0.70929	1.04977
Non-Acites	<i>Fusobacterium necrogenes</i> group	Species	Bacteria: Fusobacteria: Fusobacteria_ c: Fusobacteriales: Fusobacteriaceae: Fusobacterium	3.17443	0.00123	0.01256	0.2755
Non-Acites	<i>Lactobacillus fermentum</i>	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.14806	0.00317	0.00073	0.32159
Non-Acites	<i>Clostridium clostridioforme</i> group	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Clostridium_g24	3.13998	0.00286	0.24295	0.38182
Non-Acites	<i>Gemmiger formicilis</i> group	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Ruminococcaceae: Subdoligranulum	3.09999	0.00001	0.55361	0.55592
Non-Acites	<i>Lachnospira pectinoschiza</i>	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Lachnospira	3.08947	0.00706	0.09974	0.29136
Non-Acites	<i>Lactobacillus mucosae</i>	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.06766	0.02321	0.00169	0.30298
Non-Acites	<i>Clostridium nexile</i>	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Coprococcus_g2	2.9709	0.00003	0.02545	0.20112
Non-Acites	<i>Bifidobacterium dentium</i>	Species	Bacteria: Actinobacteria: Actinobacteria_ c: Bifidobacteriales: Bifidobacteriaceae: Bifidobacterium	2.90295	0.00022	0.00051	0.15094
Non-Acites	<i>Enterococcus faecium</i> group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Enterococcaceae: Enterococcus	2.89165	0.00071	0.01075	0.16833
Non-Acites	<i>Clostridium perfringens</i>	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Clostridiaceae: Clostridium	2.87844	0.00286	0.00491	0.1325
Non-Acites	<i>Lactobacillus sakei</i> group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	2.7887	0.00421	0.00245	0.1487

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhoiss groups
Non-Acites	Streptococcus sinensis group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Streptococcaceae: Streptococcus	2.78579	0.01086	0.03559	0.15125
Non-Acites	Holdemanella biformis	Species	Bacteria: Firmicutes: Erysipelotrichi: Erysipelotrichales: Erysipelotrichaceae: Holdemanella	2.52747	0.01702	0.07084	0.09056
Non-Acites	Bilophila wadsworthia	Species	Bacteria: Proteobacteria: Deltaproteobacteria: Desulfovibrionales: Desulfovibrionaceae: Bilophila	2.51751	0.00378	0.12238	0.1439
Non-Acites	Faecalimonas umbilicata	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Faecalimonas	2.51485	0.02421	0.00692	0.05032
Non-Acites	Clostridioides difficile group	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Peptostreptococcaceae: Clostridioides	2.4812	0.01249	0.00019	0.08637
Non-Acites	Lactobacillus delbrueckii group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	2.47657	0.00984	0.00076	0.05418
Non-Acites	Clostridium innocuum group	Species	Bacteria: Firmicutes: Erysipelotrichi: Erysipelotrichales: Erysipelotrichaceae: Longicatena	2.46901	0.00001	0.01312	0.06686
Non-Acites	Lactobacillus paracasei group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	2.38584	0.03838	0.00228	0.04578
Non-Acites	Streptococcus parasanguinis group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Streptococcaceae: Streptococcus	2.35273	0.00243	0.03373	0.08418
Non-Acites	Weissella confusa group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Leuconostocaceae: Weissella	2.21509	0.01241	0.00547	0.03894
Non-Acites	Ruminococcus lactaris	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Ruminococcus_g4	2.18969	0.00023	0.02653	0.04094
Non-Acites	Veillonella_uc	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	2.18552	0.00058	0.013	0.04056

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhoiss groups
Non-Acites	Granulicatella adiacens group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Aerococcaceae: Granulicatella	2.10827	6.90E-06	0.00665	0.03333
Acites	Escherichia coli group	Species	Bacteria: Proteobacteria: Gammaproteobacteria: Enterobacterales: Enterobacteriaceae: Escherichia	4.65494	0.00378	5.97096	14.6279
Acites	Veillonella dispar	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	4.26114	5.13E-07	1.08723	5.29052
Acites	Enterobacteriaceae group	Species	Bacteria: Proteobacteria: Gammaproteobacteria: Enterobacterales: Enterobacteriaceae: Enterobacteriaceae_g	4.09206	0.03628	0.8066	3.401
Acites	Veillonella atypica	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	4.03107	0.00014	0.13783	2.56696
Acites	Lactobacillus helveticus group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.97227	1.05E-07	0.00562	2.0837
Acites	Enterococcus faecium group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Enterococcaceae: Enterococcus	3.9295	1.05E-07	0.01075	1.40362
Acites	Staphylococcus aureus group	Species	Bacteria: Firmicutes: Bacilli: Bacillales: Staphylococcaceae: Staphylococcus	3.80608	0.01279	0.00031	1.18091
Acites	Ruminococcus gnavus	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Ruminococcus_g5	3.75899	0.00006	0.11865	1.14028
Acites	Veillonella parvula group	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	3.70104	1.51E-07	0.27363	1.33228
Acites	Lactobacillus salivarius	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.69885	8.53E-06	0.02335	1.07455
Acites	Hungatella_uc	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Hungatella	3.47484	0.03305	0.0326	0.55991

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhoiss groups
Acites	Streptococcus salivarius group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Streptococcaceae: Streptococcus	3.43959	0.01478	0.14088	0.72184
Acites	Lactobacillus fermentum	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.37033	3.53E-07	0.00073	0.47225
Acites	Lactobacillus gasseri group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.27408	0.00006	0.00784	0.38834
Acites	Streptococcus pneumoniae group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Streptococcaceae: Streptococcus	3.27225	0.00007	0.02051	0.41294
Acites	Fusobacterium varium group	Species	Bacteria: Fusobacteria: Fusobacteria_ c: Fusobacteriales: Fusobacteriaceae: Fusobacterium	3.26738	0.01386	0.12711	0.38243
Acites	Megasphaera micronuciformis	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Megasphaera	3.24265	0.00012	0.01127	0.33608
Acites	Granulicatella adiacens group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Aerococcaceae: Granulicatella	3.20647	0.00003	0.00665	0.24034
Acites	Lactobacillus paracasei group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.18023	0.00015	0.00228	0.39241
Acites	Bacteroides caccae	Species	Bacteria: Bacteroidetes: Bacteroidia: Bacteroidales: Bacteroidaceae: Bacteroides	3.16594	0.00045	0.5895	0.62553
Acites	Bifidobacterium breve	Species	Bacteria: Actinobacteria: Actinobacteria_ c: Bifidobacteriales: Bifidobacteriaceae: Bifidobacterium	3.14343	0.00992	0.00072	0.24624
Acites	Enterococcus faecalis	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Enterococcaceae: Enterococcus	3.13157	0.00108	0.00063	0.23907
Acites	Streptococcus sinensis group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Streptococcaceae: Streptococcus	3.11737	0.00326	0.03559	0.2973

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhoiss groups
Acites	Bifidobacterium adolescentis group	Species	Bacteria: Actinobacteria: Actinobacteria_c: Bifidobacteriales: Bifidobacteriaceae: Bifidobacterium	3.04312	0.0092	0.20496	0.30577
Acites	Clostridium nexile	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Coprococcus_g2	2.9659	0.00229	0.02545	0.20014
Acites	Anaerostipes hadrus group	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Anaerostipes	2.95171	0.00002	0.16337	0.23613
Acites	Lactobacillus sakei group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	2.89554	0.00018	0.00245	0.15664
Acites	Clostridium innocuum group	Species	Bacteria: Firmicutes: Erysipelotrichi: Erysipelotrichales: Erysipelotrichaceae: Longicatena	2.879	3.02E-07	0.01312	0.14752
Acites	Anaeroglobus geminatus	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Megasphaera	2.8505	0.00046	0.00325	0.13709
Acites	Streptococcus parasanguinis group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Streptococcaceae: Streptococcus	2.79598	0.02876	0.03373	0.16895
Acites	Clostridium ramosum	Species	Bacteria: Firmicutes: Erysipelotrichi: Erysipelotrichales: Erysipelotrichaceae: Clostridium_g6	2.76696	3.44E-08	0.09493	0.13702
Acites	Romboutsia timonensis	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Peptostreptococcaceae: Romboutsia	2.72239	0.00035	0.05772	0.15779
Acites	Clostridioides difficile group	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Peptostreptococcaceae: Clostridioides	2.7126	0.00105	0.00019	0.09357
Acites	Fusobacterium nucleatum group	Species	Bacteria: Fusobacteria: Fusobacteria_c: Fusobacteriales: Fusobacteriaceae: Fusobacterium	2.71036	0.00076	0.00096	0.1051

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhois groups
Acites	Rothia mucilaginos group	Species	Bacteria: Actinobacteria: Actinobacteria_c: Micrococcales: Micrococcaceae: Rothia	2.69748	0.0205	0.0008	0.07263
Acites	Dorea longicatena	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Dorea	2.56009	1.56E-06	0.11671	0.12085
Acites	Blautia wexlerae	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Blautia	2.49567	0.00077	0.13639	0.15565
Acites	Parabacteroides distasonis	Species	Bacteria: Bacteroidetes: Bacteroidia: Bacteroidales: Porphyromonadaceae: Parabacteroides	2.43011	0.00096	0.11889	0.12989
Acites	Prevotella oris	Species	Bacteria: Bacteroidetes: Bacteroidia: Bacteroidales: Prevotellaceae: Prevotella	2.41746	0.04548	0	0.04644
Acites	Ruthenibacterium lactatiformans	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Ruminococcaceae: Ruthenibacterium	2.39699	0.04021	0.07559	0.10324
Acites	Veillonella_uc	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	2.35118	2.33E-06	0.013	0.06252
Acites	Clostridium perfringens	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Clostridiaceae: Clostridium	2.32612	0.00773	0.00491	0.05037
Acites	Bifidobacterium dentium	Species	Bacteria: Actinobacteria: Actinobacteria_c: Bifidobacteriales: Bifidobacteriaceae: Bifidobacterium	2.30592	2.56E-07	0.00051	0.04233
Acites	Dorea formicigenerans	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Dorea	2.27034	0.00055	0.02263	0.05173
Acites	Clostridium spiroforme	Species	Bacteria: Firmicutes: Erysipelotrichi: Erysipelotrichales: Erysipelotrichaceae: Clostridium_g6	2.24891	0.04647	0.00133	0.03225
Acites	Parabacteroides_uc	Species	Bacteria: Bacteroidetes: Bacteroidia: Bacteroidales: Porphyromonadaceae: Parabacteroides	2.17498	0.03535	0.04526	0.0685
Acites	Hungatella effluvii	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Hungatella	2.13893	0.00742	0.00058	0.02318

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhois groups
Acites	Weissella confusa group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Leuconostocaceae: Weissella	2.09829	0.02221	0.00547	0.03249
Acites	Abiotrophia defectiva	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Aerococcaceae: Abiotrophia	2.05934	0.01202	0.00013	0.01662
Acites	Pseudomonas aeruginosa group	Species	Bacteria: Proteobacteria: Gammaproteobacteria: Pseudomonadales: Pseudomonadaceae: Pseudomonas	2.00591	0.00872	0.00006	0.01705
Non-SBP	Veillonella dispar	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	4.04099	0.00061	1.08723	2.9863
Non-SBP	Veillonella atypica	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	3.8652	0.00224	0.13783	1.56778
Non-SBP	Lactobacillus gasseri group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.69269	0.00158	0.00784	1.10654
Non-SBP	Ruminococcus gnavus	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Ruminococcus_g5	3.48919	0.00013	0.11865	0.66918
Non-SBP	Streptococcus salivarius group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Streptococcaceae: Streptococcus	3.45479	0.01728	0.14088	0.7081
Non-SBP	Lactobacillus salivarius	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.43197	0.00039	0.02335	0.5845
Non-SBP	Bacteroides stercoris	Species	Bacteria: Bacteroidetes: Bacteroidia: Bacteroidales: Bacteroidaceae: Bacteroides	3.33581	0.01032	0.70929	0.8843
Non-SBP	Megasphaera micronuciformis	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Megasphaera	3.29975	0.0094	0.01127	0.40751
Non-SBP	Lactobacillus helveticus group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.24894	0.00004	0.00562	0.27767
Non-SBP	Veillonella parvula group	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	3.22192	1.64E-06	0.27363	0.53266

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhoiss groups
Non-SBP	Streptococcus pneumoniae group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Streptococcaceae: Streptococcus	3.13886	0.00004	0.02051	0.32817
Non-SBP	Clostridium clostridioforme group	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Clostridium_g24	3.09193	0.00152	0.24295	0.40863
Non-SBP	Streptococcus sinensis group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Streptococcaceae: Streptococcus	3.0835	0.00687	0.03559	0.27359
Non-SBP	Enterococcus faecium group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Enterococcaceae: Enterococcus	3.06936	0.00007	0.01075	0.2599
Non-SBP	Fusobacterium varium group	Species	Bacteria: Fusobacteria: Fusobacteria_ c: Fusobacteriales: Fusobacteriaceae: Fusobacterium	3.02429	0.01925	0.12711	0.35145
Non-SBP	Enterococcus faecalis	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Enterococcaceae: Enterococcus	2.92914	0.04564	0.00063	0.31259
Non-SBP	Lactobacillus sakei group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	2.92747	0.00578	0.00245	0.17218
Non-SBP	Lactobacillus rogosae group	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Lachnospira	2.91629	0.00003	0.40923	0.4425
Non-SBP	Fusobacterium necrogenes group	Species	Bacteria: Fusobacteria: Fusobacteria_ c: Fusobacteriales: Fusobacteriaceae: Fusobacterium	2.90801	0.00221	0.01256	0.18935
Non-SBP	Lactobacillus fermentum	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	2.88207	0.00039	0.00073	0.18615
Non-SBP	Clostridium nexile	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Coprococcus_g2	2.87813	0.00002	0.02545	0.18062

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhoiss groups
Non-SBP	Bifidobacterium dentium	Species	Bacteria: Actinobacteria: Actinobacteria_c: Bifidobacteriales: Bifidobacteriaceae: Bifidobacterium	2.84086	6.17E-06	0.00051	0.1118
Non-SBP	Lachnospira pectinoschiza	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Lachnospira	2.83689	0.00306	0.09974	0.21254
Non-SBP	Streptococcus parasanguinis group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Streptococcaceae: Streptococcus	2.78088	0.00101	0.03373	0.15455
Non-SBP	Clostridium perfringens	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Clostridiaceae: Clostridium	2.67315	0.00176	0.00491	0.08643
Non-SBP	Parabacteroides distasonis	Species	Bacteria: Bacteroidetes: Bacteroidia: Bacteroidales: Porphyromonadaceae: Parabacteroides	2.62384	0.00511	0.11889	0.17228
Non-SBP	Lactobacillus mucosae	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	2.58263	0.01874	0.00169	0.08333
Non-SBP	Lactobacillus delbrueckii group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	2.43471	0.00861	0.00076	0.03685
Non-SBP	Anaerostipes hadrus group	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Anaerostipes	2.43359	0.01712	0.16337	0.17838
Non-SBP	Bilophila wadsworthia	Species	Bacteria: Proteobacteria: Deltaproteobacteria: Desulfobivionales: Desulfobivronaceae: Bilophila	2.42092	0.03425	0.12238	0.14811
Non-SBP	Clostridium innocuum group	Species	Bacteria: Firmicutes: Erysipelotrichi: Erysipelotrichales: Erysipelotrichaceae: Longicatena	2.34678	4.68E-06	0.01312	0.0479
Non-SBP	Faecalimonas umbilicata	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Faecalimonas	2.25608	0.00663	0.00692	0.04181
Non-SBP	Veillonella_uc	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	2.20666	0.00015	0.013	0.04067

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhois groups
Non-SBP	Weissella confusa group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Leuconostocaceae: Weissella	2.16137	0.00401	0.00547	0.03771
Non-SBP	Lactobacillus paracasei group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	2.12837	0.03312	0.00228	0.03788
Non-SBP	Clostridioides difficile group	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Peptostreptococcaceae: Clostridioides	2.10849	0.00149	0.00019	0.0268
Non-SBP	Agathobaculum butyriciproducens group	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Ruminococcaceae: Agathobaculum	2.084	0.00496	0.07775	0.08416
Non-SBP	Granulicatella adiacens group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Aerococcaceae: Granulicatella	2.01457	1.41E-06	0.00665	0.02761
SBP	Escherichia coli group	Species	Bacteria: Proteobacteria: Gammaproteobacteria: Enterobacterales: Enterobacteriaceae: Escherichia	4.67498	0.00427	5.97096	15.80824
SBP	Veillonella dispar	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	4.50817	2.07E-07	1.08723	7.31589
SBP	Enterobacteriaceae group	Species	Bacteria: Proteobacteria: Gammaproteobacteria: Enterobacterales: Enterobacteriaceae: Enterobacteriaceae_g	4.20064	0.02439	0.8066	4.11043
SBP	Lactobacillus helveticus group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	4.12114	2.82E-06	0.00562	3.07591
SBP	Veillonella atypica	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	4.12072	0.0022	0.13783	2.48145
SBP	Enterococcus faecium group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Enterococcaceae: Enterococcus	3.96721	1.72E-07	0.01075	1.80326
SBP	Veillonella parvula group	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	3.93059	8.13E-06	0.27363	1.93312

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhoiss groups
SBP	Staphylococcus aureus group	Species	Bacteria: Firmicutes: Bacilli: Bacillales: Staphylococcaceae: Staphylococcus	3.87087	0.02518	0.00031	1.6776
SBP	Ruminococcus gnavus	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Ruminococcus_g5	3.79598	0.00065	0.11865	1.22359
SBP	Lactobacillus salivarius	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.77864	0.00031	0.02335	1.27154
SBP	Bacteroides dorei	Species	Bacteria: Bacteroidetes: Bacteroidia: Bacteroidales: Bacteroidaceae: Bacteroides	3.71953	0.01365	1.26622	1.97512
SBP	Hungatella_uc	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Hungatella	3.64185	0.02686	0.0326	0.7701
SBP	Streptococcus pneumoniae group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Streptococcaceae: Streptococcus	3.56606	0.00032	0.02051	0.65499
SBP	Lactobacillus paracasei group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.54553	0.00002	0.00228	0.54876
SBP	Lactobacillus fermentum	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.5381	3.35E-07	0.00073	0.71389
SBP	Bacteroides ovatus group	Species	Bacteria: Bacteroidetes: Bacteroidia: Bacteroidales: Bacteroidaceae: Bacteroides	3.4297	0.02556	0.7798	1.08227
SBP	Lactobacillus gasseri group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.36073	0.00178	0.00784	0.52512
SBP	Granulicatella adiacens group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Aerococcaceae: Granulicatella	3.32305	0.00025	0.00665	0.33503
SBP	Megasphaera micronuciformis	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Megasphaera	3.13243	0.00002	0.01127	0.27749
SBP	Enterococcus faecalis	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Enterococcaceae: Enterococcus	3.12679	0.00018	0.00063	0.32087

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhoiss groups
SBP	<i>Clostridium nexile</i>	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Coproccoccus_g2	3.04941	0.01493	0.02545	0.22671
SBP	<i>Anaeroglobus geminatus</i>	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Megasphaera	3.04794	0.00068	0.00325	0.19323
SBP	<i>Clostridium innocuum</i> group	Species	Bacteria: Firmicutes: Erysipelotrichi: Erysipelotrichales: Erysipelotrichaceae: Longicatena	3.04358	3.93E-07	0.01312	0.20644
SBP	<i>Streptococcus sinensis</i> group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Streptococcaceae: Streptococcus	2.97782	0.00411	0.03559	0.19782
SBP	<i>Clostridium ramosum</i>	Species	Bacteria: Firmicutes: Erysipelotrichi: Erysipelotrichales: Erysipelotrichaceae: Clostridium_g6	2.952	5.65E-07	0.09493	0.20867
SBP	<i>Anaerostipes hadrus</i> group	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Anaerostipes	2.9472	2.39E-06	0.16337	0.24225
SBP	<i>Clostridioides difficile</i> group	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Peptostreptococcaceae: Clostridioides	2.93932	0.0065	0.00019	0.17497
SBP	<i>Fusobacterium nucleatum</i> group	Species	Bacteria: Fusobacteria: Fusobacteria_ c: Fusobacteriales: Fusobacteriaceae: Fusobacterium	2.93416	0.00405	0.00096	0.14395
SBP	<i>Lactobacillus sakei</i> group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	2.84139	0.00003	0.00245	0.12909
SBP	<i>Clostridium tertium</i> group	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Clostridiaceae: Clostridium	2.76929	0.02069	0.01324	0.15826
SBP	<i>Romboutsia timonensis</i>	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Peptostreptococcaceae: Romboutsia	2.75259	1.29E-06	0.05772	0.18386
SBP	<i>Dorea longicatena</i>	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Dorea	2.70671	4.40E-08	0.11671	0.13122

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhoiss groups
SBP	<i>Bifidobacterium breve</i>	Species	Bacteria: Actinobacteria: Actinobacteria_c: Bifidobacteriales: Bifidobacteriaceae: Bifidobacterium	2.70002	0.00481	0.00072	0.12873
SBP	<i>Holdemanella biformis</i>	Species	Bacteria: Firmicutes: Erysipelotrichi: Erysipelotrichales: Erysipelotrichaceae: Holdemanella	2.67146	0.01502	0.07084	0.10372
SBP	<i>Lactobacillus reuteri</i> group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	2.66607	0.0434	0.08524	0.09546
SBP	<i>Clostridium perfringens</i>	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Clostridiaceae: Clostridium	2.60677	0.01903	0.00491	0.07641
SBP	<i>Veillonella_uc</i>	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	2.5099	2.41E-06	0.013	0.07161
SBP	<i>Bifidobacterium dentium</i>	Species	Bacteria: Actinobacteria: Actinobacteria_c: Bifidobacteriales: Bifidobacteriaceae: Bifidobacterium	2.4424	3.21E-06	0.00051	0.0481
SBP	<i>Ruthenibacterium lactatiformans</i>	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Ruminococcaceae: Ruthenibacterium	2.33349	0.00231	0.07559	0.10004
SBP	<i>Bifidobacterium scardovii</i>	Species	Bacteria: Actinobacteria: Actinobacteria_c: Bifidobacteriales: Bifidobacteriaceae: Bifidobacterium	2.31009	0.00526	0	0.04516
SBP	<i>Haemophilus pittmaniae</i>	Species	Bacteria: Proteobacteria: Gammaproteobacteria: Pasteurellales: Pasteurellaceae: Haemophilus	2.30284	0.04889	0.01929	0.04676
SBP	<i>Dorea formicigenerans</i>	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Dorea	2.24383	0.00055	0.02263	0.05927
SBP	<i>Hungatella effluvii</i>	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Hungatella	2.22481	0.00456	0.00058	0.03227

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhoiss groups
SBP	Romboutsia sedimentorum	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Peptostreptococcaceae: Romboutsia	2.19337	0.03082	0.00136	0.0367
SBP	Abiotrophia defectiva	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Aerococcaceae: Abiotrophia	2.19047	0.01097	0.00013	0.02361
SBP	Citrobacter amalonaticus group	Species	Bacteria: Proteobacteria: Gammaproteobacteria: Enterobacteriales: Enterobacteriaceae: Citrobacter	2.163	0.00927	0.00033	0.03123
SBP	Campylobacter concisus group	Species	Bacteria: Proteobacteria: Epsilonproteobacteria: Campylobacterales: Campylobacteraceae: Campylobacter	2.13204	0.00248	0.00131	0.02473
SBP	Raoultella planticola group	Species	Bacteria: Proteobacteria: Gammaproteobacteria: Enterobacteriales: Enterobacteriaceae: Raoultella	2.10782	0.02414	0.02216	0.04316
SBP	Pseudomonas aeruginosa group	Species	Bacteria: Proteobacteria: Gammaproteobacteria: Pseudomonadales: Pseudomonadaceae: Pseudomonas	2.04197	0.00344	0.00006	0.02264
SBP	Turicibacter sanguinis	Species	Bacteria: Firmicutes: Erysipelotrichi: Erysipelotrichales: Erysipelotrichaceae: Turicibacter	2.03202	0.04179	0.01151	0.03468
SBP	Lactobacillus delbrueckii group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	2.00093	0.0048	0.00076	0.01726
Non-Encephalopathy	Enterococcus faecium group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Enterococcaceae: Enterococcus	4.32193	0.00001	0.01075	2.18377
Non-Encephalopathy	Lactobacillus helveticus group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	4.01751	0.00001	0.00562	1.26806
Non-Encephalopathy	Alistipes onderdonkii	Species	Bacteria: Bacteroidetes: Bacteroidia: Bacteroidales: Rikenellaceae: Alistipes	3.88768	0.00255	0.11923	0.97853

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhois groups
Non-Encephalopathy	Enterococcus faecalis	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Enterococcaceae: Enterococcus	3.78995	0.00106	0.00063	0.720515
Non-Encephalopathy	Lactobacillus salivarius	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.72384	0.00229	0.02335	0.852855
Non-Encephalopathy	Lactobacillus gasseri group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.67729	0.00182	0.00784	0.64211
Non-Encephalopathy	Ruminococcus gnavus	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Ruminococcus_g5	3.65182	0.00005	0.11865	0.626105
Non-Encephalopathy	Veillonella parvula group	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	3.52943	1.71E-06	0.27363	0.622095
Non-Encephalopathy	Gemmiger formicilis group	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Ruminococcaceae: Subdoligranulum	3.38185	1.03E-06	0.55361	0.635925
Non-Encephalopathy	Fusobacterium varium group	Species	Bacteria: Fusobacteria: Fusobacteria_ c: Fusobacteriales: Fusobacteriaceae: Fusobacterium	3.35408	0.00359	0.12711	0.244715
Non-Encephalopathy	Lactobacillus fermentum	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.31638	0.00016	0.00073	0.22165
Non-Encephalopathy	Streptococcus pneumoniae group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Streptococcaceae: Streptococcus	3.29458	0.00022	0.02051	0.333725
Non-Encephalopathy	Flavonifractor plautii	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Ruminococcaceae: Pseudoflavonifractor	3.26899	0.02056	0.14283	0.322425
Non-Encephalopathy	Hungatella_uc	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Hungatella	3.23458	0.00925	0.0326	0.27783
Non-Encephalopathy	Ruminococcus bromii	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Ruminococcaceae: Ruminococcus_g2	3.21884	0.00034	0.24601	0.25024

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhois groups
Non-Encephalopathy	Odoribacter splanchnicus	Species	Bacteria: Bacteroidetes: Bacteroidia: Bacteroidales: Odoribacteraceae: Odoribacter	3.17569	0.00024	0.21212	0.223555
Non-Encephalopathy	Streptococcus sinensis group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Streptococcaceae: Streptococcus	3.13856	0.00097	0.03559	0.270355
Non-Encephalopathy	Holdemanella biformis	Species	Bacteria: Firmicutes: Erysipelotrichi: Erysipelotrichales: Erysipelotrichaceae: Holdemanella	3.13482	0.01547	0.07084	0.219785
Non-Encephalopathy	Granulicatella adiacens group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Aerococcaceae: Granulicatella	3.0871	0.00002	0.00665	0.21141
Non-Encephalopathy	Lactobacillus sakei group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.04331	0.00268	0.00245	0.14125
Non-Encephalopathy	Anaerostipes hadrus group	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Anaerostipes	3.03216	0.00732	0.16337	0.18878
Non-Encephalopathy	Clostridium nexile	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Coprococcus_g2	2.94652	0.00039	0.02545	0.137015
Non-Encephalopathy	Bifidobacterium breve	Species	Bacteria: Actinobacteria: Actinobacteria_ c: Bifidobacteriales: Bifidobacteriaceae: Bifidobacterium	2.93826	0.01914	0.00072	0.092165
Non-Encephalopathy	Fusobacterium necrogenes group	Species	Bacteria: Fusobacteria: Fusobacteria_ c: Fusobacteriales: Fusobacteriaceae: Fusobacterium	2.93192	0.00306	0.01256	0.079075
Non-Encephalopathy	Bifidobacterium dentium	Species	Bacteria: Actinobacteria: Actinobacteria_ c: Bifidobacteriales: Bifidobacteriaceae: Bifidobacterium	2.83489	4.06E-06	0.00051	0.069135
Non-Encephalopathy	Anaeroglobus geminatus	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Megasphaera	2.81304	0.00234	0.00325	0.065675

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhois groups
Non-Encephalopathy	<i>Clostridium perfringens</i>	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Clostridiaceae: Clostridium	2.75786	0.00058	0.00491	0.071305
Non-Encephalopathy	Streptococcus parasanguinis group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Streptococcaceae: Streptococcus	2.72245	0.01255	0.03373	0.118375
Non-Encephalopathy	<i>Clostridium innocuum</i> group	Species	Bacteria: Firmicutes: Erysipelotrichi: Erysipelotrichales: Erysipelotrichaceae: Longicatena	2.68193	2.24E-06	0.01312	0.082385
Non-Encephalopathy	<i>Ruminococcus lactaris</i>	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Ruminococcus_g4	2.61256	5.68E-06	0.02653	0.053485
Non-Encephalopathy	<i>Clostridium aldenense</i>	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Clostridium_g24	2.55198	0.04739	0.03173	0.066335
Non-Encephalopathy	Fusobacterium nucleatum group	Species	Bacteria: Fusobacteria: Fusobacteria_c: Fusobacteriales: Fusobacteriaceae: Fusobacterium	2.5453	0.00748	0.00096	0.04698
Non-Encephalopathy	<i>Veillonella_uc</i>	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	2.45425	8.96E-06	0.013	0.040725
Non-Encephalopathy	Peptostreptococcus stomatis group	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Peptostreptococcaceae: Peptostreptococcus	2.45361	0.00384	0.00011	0.02959
Non-Encephalopathy	<i>Pseudomonas aeruginosa</i> group	Species	Bacteria: Proteobacteria: Gammaproteobacteria: Pseudomonadales: Pseudomonadaceae: Pseudomonas	2.35166	0.00004	0.00006	0.02082
Non-Encephalopathy	<i>Faecalimonas umbilicata</i>	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Faecalimonas	2.31856	0.02869	0.00692	0.019665
Non-Encephalopathy	<i>Lactobacillus paracasei</i> group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	2.25951	0.01114	0.00228	0.027085
Non-Encephalopathy	<i>Alistipes ihumii</i>	Species	Bacteria: Bacteroidetes: Bacteroidia: Bacteroidales: Rikenellaceae: Alistipes	2.23679	0.01604	0.01021	0.02623

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhoiss groups
Non-Encephalopathy	Enhydrobacter aerosaccus group	Species	Bacteria: Proteobacteria: Gammaproteobacteria: Pseudomonadales: Moraxellaceae: Enhydrobacter	2.164	6.09E-10	0	0.01331
Non-Encephalopathy	Butyricimonas faecihominis	Species	Bacteria: Bacteroidetes: Bacteroidia: Bacteroidales: Odoribacteraceae: Butyricimonas	2.16202	0.00745	0.01684	0.01838
Non-Encephalopathy	Clostridium scindens	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Clostridium_g21	2.13594	0.02396	0.01088	0.0204
Non-Encephalopathy	Staphylococcus aureus group	Species	Bacteria: Firmicutes: Bacilli: Bacillales: Staphylococcaceae: Staphylococcus	2.0151	0.00003	0.00031	0.010585
Encephalopathy	Veillonella dispar	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	4.43635	0.00015	1.08723	7.49158
Encephalopathy	Staphylococcus aureus group	Species	Bacteria: Firmicutes: Bacilli: Bacillales: Staphylococcaceae: Staphylococcus	4.23222	0.00089	0.00031	3.53158
Encephalopathy	Bacteroides dorei	Species	Bacteria: Bacteroidetes: Bacteroidia: Bacteroidales: Bacteroidaceae: Bacteroides	4.13481	0.03999	1.26622	4.32286
Encephalopathy	Lactobacillus gasseri group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	4.01104	0.02543	0.00784	2.45874
Encephalopathy	Veillonella parvula group	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	4.00095	0.00005	0.27363	2.67049
Encephalopathy	Bifidobacterium longum group	Species	Bacteria: Actinobacteria: Actinobacteria_c: Bifidobacteriales: Bifidobacteriaceae: Bifidobacterium	3.86149	0.03251	0.18545	1.679
Encephalopathy	Ruminococcus gnavus	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Ruminococcus_g5	3.85187	0.01206	0.11865	1.12422
Encephalopathy	Veillonella atypica	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	3.80622	0.00058	0.13783	1.46255

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhoiss groups
Encephalopathy	Streptococcus pneumoniae group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Streptococcaceae: Streptococcus	3.74684	0.00047	0.02051	1.22989
Encephalopathy	Lactobacillus paracasei group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.73444	0.00006	0.00228	1.14159
Encephalopathy	Lactobacillus salivarius	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.68733	0.00008	0.02335	1.10665
Encephalopathy	Enterococcus faecium group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Enterococcaceae: Enterococcus	3.62393	4.02E-07	0.01075	0.81903
Encephalopathy	Lactobacillus fermentum	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.50117	9.06E-07	0.00073	0.6983
Encephalopathy	Lactobacillus sakei group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.4451	0.00081	0.00245	0.45175
Encephalopathy	Bacteroides stercoris	Species	Bacteria: Bacteroidetes: Bacteroidia: Bacteroidales: Bacteroidaceae: Bacteroides	3.42204	0.00234	0.70929	0.78964
Encephalopathy	Megasphaera micronuciformis	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Megasphaera	3.35355	0.00243	0.01127	0.57341
Encephalopathy	Streptococcus salivarius group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Streptococcaceae: Streptococcus	3.33016	0.0138	0.14088	0.57046
Encephalopathy	Lactobacillus helveticus group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.27568	0.00077	0.00562	0.50677
Encephalopathy	Bacteroides caccae	Species	Bacteria: Bacteroidetes: Bacteroidia: Bacteroidales: Bacteroidaceae: Bacteroides	3.25798	0.00961	0.5895	0.70625
Encephalopathy	Clostridium celatum group	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Clostridiaceae: Clostridium	3.14369	0.01856	0.06999	0.37714
Encephalopathy	Clostridium nexile	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Coprococcus_g2	3.14304	0.00811	0.02545	0.31866

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhoiss groups
Encephalopathy	Bifidobacterium breve	Species	Bacteria: Actinobacteria: Actinobacteria_c: Bifidobacteriales: Bifidobacteriaceae: Bifidobacterium	3.07966	0.00938	0.00072	0.22609
Encephalopathy	Ruthenibacterium lactatiformans	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Ruminococcaceae: Ruthenibacterium	3.05272	0.03136	0.07559	0.20403
Encephalopathy	Clostridium innocuum group	Species	Bacteria: Firmicutes: Erysipelotrichi: Erysipelotrichales: Erysipelotrichaceae: Longicatena	2.93078	0.00003	0.01312	0.14398
Encephalopathy	Prevotella buccae	Species	Bacteria: Bacteroidetes: Bacteroidia: Bacteroidales: Prevotellaceae: Prevotella	2.90974	0.0081	0.00303	0.19428
Encephalopathy	Parabacteroides distasonis	Species	Bacteria: Bacteroidetes: Bacteroidia: Bacteroidales: Porphyromonadaceae: Parabacteroides	2.89716	0.01615	0.11889	0.23224
Encephalopathy	Fusobacterium necrogenes group	Species	Bacteria: Fusobacteria: Fusobacteria_c: Fusobacteriales: Fusobacteriaceae: Fusobacterium	2.87696	0.04702	0.01256	0.16406
Encephalopathy	Clostridium ramosum	Species	Bacteria: Firmicutes: Erysipelotrichi: Erysipelotrichales: Erysipelotrichaceae: Clostridium_g6	2.79502	0.00002	0.09493	0.1485
Encephalopathy	Enterococcus faecalis	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Enterococcaceae: Enterococcus	2.76148	0.0011	0.00063	0.11267
Encephalopathy	Bifidobacterium scardovii	Species	Bacteria: Actinobacteria: Actinobacteria_c: Bifidobacteriales: Bifidobacteriaceae: Bifidobacterium	2.67989	0.00466	0	0.10411
Encephalopathy	Lactobacillus harbinensis	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	2.60077	0.00793	0.00006	0.08578
Encephalopathy	Lachnospira pectinoschiza	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Lachnospira	2.55938	0.02572	0.09974	0.14521

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhoiss groups
Encephalopathy	Citrobacter amalonaticus group	Species	Bacteria: Proteobacteria: Gammaproteobacteria: Enterobacterales: Enterobacteriaceae: Citrobacter	2.46691	0.0081	0.00033	0.05702
Encephalopathy	Weissella confusa group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Leuconostocaceae: Weissella	2.4638	0.00498	0.00547	0.05613
Encephalopathy	Clostridioides difficile group	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Peptostreptococcaceae: Clostridioides	2.43888	0.00002	0.00019	0.05051
Encephalopathy	Granulicatella adiacens group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Aerococcaceae: Granulicatella	2.30341	0.00017	0.00665	0.05082
Encephalopathy	Paraprevotella xylaniphila	Species	Bacteria: Bacteroidetes: Bacteroidia: Bacteroidales: Prevotellaceae: Paraprevotella	2.28254	0.0302	0.02848	0.04115
Encephalopathy	Collinsella intestinalis group	Species	Bacteria: Actinobacteria: Coriobacteriia: Coriobacteriales: Coriobacteriaceae: Collinsella	2.22457	0.00466	0	0.03108
Encephalopathy	Veillonella_uc	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	2.22302	0.00002	0.013	0.0482
Encephalopathy	Campylobacter gracilis	Species	Bacteria: Proteobacteria: Epsilonproteobacteria: Campylobacterales: Campylobacteraceae: Campylobacter	2.1493	0.00323	0.00062	0.02753
Encephalopathy	Pseudomonas aeruginosa group	Species	Bacteria: Proteobacteria: Gammaproteobacteria: Pseudomonadales: Pseudomonadaceae: Pseudomonas	2.0363	0.00074	0.00006	0.0202
Encephalopathy	Lactobacillus delbrueckii group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	2.00771	0.00396	0.00076	0.02171
Non-HRS	Escherichia coli group	Species	Bacteria: Proteobacteria: Gammaproteobacteria: Enterobacterales: Enterobacteriaceae: Escherichia	4.51055	0.02713	5.97096	12.18825

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhoiss groups
Non-HRS	Enterobacteriaceae group	Species	Bacteria: Proteobacteria: Gammaproteobacteria: Enterobacterales: Enterobacteriaceae: Enterobacteriaceae_g	4.19603	0.03042	0.8066	3.67422
Non-HRS	Veillonella dispar	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	4.14228	0.00028	1.08723	4.03213
Non-HRS	Lactobacillus helveticus group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.7794	0.00002	0.00562	1.40115
Non-HRS	Veillonella atypica	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	3.75383	0.02871	0.13783	1.23523
Non-HRS	Ruminococcus gnavus	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Ruminococcus_g5	3.64706	0.00021	0.11865	0.93041
Non-HRS	Clostridium clostridioforme group	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Clostridium_g24	3.57914	0.00317	0.24295	0.9291
Non-HRS	Lactobacillus gasseri group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.41233	0.0009	0.00784	0.49222
Non-HRS	Enterococcus faecium group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Enterococcaceae: Enterococcus	3.39863	6.04E-06	0.01075	0.49907
Non-HRS	Enterococcus faecalis	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Enterococcaceae: Enterococcus	3.3739	0.00745	0.00063	0.44513
Non-HRS	Streptococcus pneumoniae group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Streptococcaceae: Streptococcus	3.33009	0.00006	0.02051	0.47552
Non-HRS	Veillonella parvula group	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	3.25095	0.00005	0.27363	0.55053
Non-HRS	Megasphaera micronuciformis	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Megasphaera	3.2453	0.01162	0.01127	0.35336
Non-HRS	Bacteroides stercoris	Species	Bacteria: Bacteroidetes: Bacteroidia: Bacteroidales: Bacteroidaceae: Bacteroides	3.16868	0.0016	0.70929	0.71953

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhoiss groups
Non-HRS	Granulicatella adiacens group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Aerococcaceae: Granulicatella	3.04115	4.43E-06	0.00665	0.17961
Non-HRS	Lactobacillus sakei group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.03164	0.00503	0.00245	0.19802
Non-HRS	Bacteroides xylanisolvens group	Species	Bacteria: Bacteroidetes: Bacteroidia: Bacteroidales: Bacteroidaceae: Bacteroides	3.01453	0.02827	0.55197	0.65905
Non-HRS	Streptococcus sinensis group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Streptococcaceae: Streptococcus	2.99425	0.01239	0.03559	0.25217
Non-HRS	Lactobacillus fermentum	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	2.9908	0.00017	0.00073	0.22787
Non-HRS	Lactobacillus salivarius	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	2.93318	0.00195	0.02335	0.21605
Non-HRS	Clostridium nexile	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Coprococcus_g2	2.91276	0.00002	0.02545	0.19201
Non-HRS	Fusobacterium necrogenes group	Species	Bacteria: Fusobacteria: Fusobacteria_ c: Fusobacteriales: Fusobacteriaceae: Fusobacterium	2.88102	0.01723	0.01256	0.16634
Non-HRS	Lactobacillus mucosae	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	2.85173	0.04042	0.00169	0.19064
Non-HRS	Streptococcus parasanguinis group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Streptococcaceae: Streptococcus	2.78208	0.00696	0.03373	0.17807
Non-HRS	Romboutsia timonensis	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Peptostreptococcaceae: Romboutsia	2.77525	0.02283	0.05772	0.18504
Non-HRS	Lachnospira pectinoschiza	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Lachnospira	2.72622	0.00004	0.09974	0.15391

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhoiss groups
Non-HRS	Clostridioides difficile group	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Peptostreptococcaceae: Clostridioides	2.63691	0.00179	0.00019	0.07276
Non-HRS	Mitsuokella jalaludinii	Species	Bacteria: Firmicutes: Negativicutes: Selenomonadales: Selenomonadaceae: Mitsuokella	2.6346	0.03083	0.05095	0.13522
Non-HRS	Bifidobacterium dentium	Species	Bacteria: Actinobacteria: Actinobacteria_ c: Bifidobacteriales: Bifidobacteriaceae: Bifidobacterium	2.60954	0.00007	0.00051	0.08925
Non-HRS	Clostridium innocuum group	Species	Bacteria: Firmicutes: Erysipelotrichi: Erysipelotrichales: Erysipelotrichaceae: Longicatena	2.56901	4.23E-07	0.01312	0.0756
Non-HRS	Parabacteroides distasonis	Species	Bacteria: Bacteroidetes: Bacteroidia: Bacteroidales: Porphyromonadaceae: Parabacteroides	2.42136	0.00036	0.11889	0.13495
Non-HRS	Bifidobacterium scardovii	Species	Bacteria: Actinobacteria: Actinobacteria_ c: Bifidobacteriales: Bifidobacteriaceae: Bifidobacterium	2.35049	0.01468	0	0.0401
Non-HRS	Clostridium perfringens	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Clostridiaceae: Clostridium	2.34568	0.00313	0.00491	0.05159
Non-HRS	Lactobacillus paracasei group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	2.26074	0.01401	0.00228	0.03948
Non-HRS	Weissella confusa group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Leuconostocaceae: Weissella	2.25369	0.00312	0.00547	0.04113
Non-HRS	Lactobacillus delbrueckii group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	2.19985	0.0094	0.00076	0.03158
Non-HRS	Romboutsia sedimentorum	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Peptostreptococcaceae: Romboutsia	2.0682	0.02611	0.00136	0.02427

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhois groups
Non-HRS	Collinsella intestinalis group	Species	Bacteria: Actinobacteria: Coriobacteriai: Coriobacteriales: Coriobacteriaceae: Collinsella	2.05875	0.0071	0	0.02017
Non-HRS	Faecalimonas umbilicata	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Faecalimonas	2.05219	0.04383	0.00692	0.03472
Non-HRS	Abiotrophia defectiva	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Aerococcaceae: Abiotrophia	2.01681	0.00897	0.00013	0.01647
HRS	Veillonella dispar	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	4.4444	6.47E-08	1.08723	6.82026
HRS	Veillonella atypica	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	4.27117	1.67E-06	0.13783	3.69615
HRS	Veillonella parvula group	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	4.08652	6.30E-09	0.27363	2.53688
HRS	Enterococcus faecium group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Enterococcaceae: Enterococcus	4.04289	4.10E-06	0.01075	1.94526
HRS	Lactobacillus salivarius	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	4.01813	5.63E-06	0.02335	2.46724
HRS	Lactobacillus gasseri group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.88451	0.0048	0.00784	1.72168
HRS	Lactobacillus helveticus group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.85943	2.58E-06	0.00562	1.68832
HRS	Lactobacillus fermentum	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.62689	1.49E-07	0.00073	0.85797
HRS	Ruminococcus gnavus	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Ruminococcus_g5	3.60084	0.0004	0.11865	0.85655
HRS	Bacteroides dorei	Species	Bacteria: Bacteroidetes: Bacteroidia: Bacteroidales: Bacteroidaceae: Bacteroides	3.50497	0.02054	1.26622	1.39141

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhoiss groups
HRS	Lactobacillus paracasei group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.48434	9.12E-06	0.00228	0.78074
HRS	Streptococcus salivarius group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Streptococcaceae: Streptococcus	3.39489	0.00199	0.14088	0.65195
HRS	Streptococcus pneumoniae group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Streptococcaceae: Streptococcus	3.36682	0.00025	0.02051	0.45445
HRS	Fusobacterium varium group	Species	Bacteria: Fusobacteria: Fusobacteria_ c: Fusobacteriales: Fusobacteriaceae: Fusobacterium	3.20587	0.02361	0.12711	0.47807
HRS	Megasphaera micronuciformis	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Megasphaera	3.19841	7.10E-07	0.01127	0.34661
HRS	Anaeroglobus geminatus	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Megasphaera	3.16709	0.00042	0.00325	0.28048
HRS	Anaerostipes hadrus group	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Anaerostipes	3.08711	4.86E-06	0.16337	0.33924
HRS	Fusobacterium nucleatum group	Species	Bacteria: Fusobacteria: Fusobacteria_ c: Fusobacteriales: Fusobacteriaceae: Fusobacterium	3.06092	9.32E-06	0.00096	0.20008
HRS	Clostridium innocuum group	Species	Bacteria: Firmicutes: Erysipelotrichi: Erysipelotrichales: Erysipelotrichaceae: Longicatena	3.01657	0.00001	0.01312	0.21355
HRS	Bifidobacterium breve	Species	Bacteria: Actinobacteria: Actinobacteria_ c: Bifidobacteriales: Bifidobacteriaceae: Bifidobacterium	2.97853	0.01014	0.00072	0.17286
HRS	Streptococcus sinensis group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Streptococcaceae: Streptococcus	2.9554	0.00081	0.03559	0.21394

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhoiss groups
HRS	<i>Clostridium perfringens</i>	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Clostridiaceae: Clostridium	2.93985	0.01361	0.00491	0.15485
HRS	<i>Raoultella planticola</i> group	Species	Bacteria: Proteobacteria: Gammaproteobacteria: Enterobacterales: Enterobacteriaceae: Raoultella	2.93916	0.01167	0.02216	0.18327
HRS	<i>Clostridium ramosum</i>	Species	Bacteria: Firmicutes: Erysipelotrichi: Erysipelotrichales: Erysipelotrichaceae: Clostridium_g6	2.83099	1.41E-06	0.09493	0.19638
HRS	<i>Dorea longicatena</i>	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Dorea	2.80911	3.93E-06	0.11671	0.18595
HRS	<i>Granulicatella adiacens</i> group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Aerococcaceae: Granulicatella	2.79721	0.00015	0.00665	0.11447
HRS	<i>Prevotella oris</i>	Species	Bacteria: Bacteroidetes: Bacteroidia: Bacteroidales: Prevotellaceae: Prevotella	2.79143	0.01887	0	0.09734
HRS	<i>Veillonella_uc</i>	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	2.74863	8.92E-08	0.013	0.11847
HRS	<i>Blautia wexlerae</i>	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Blautia	2.68705	0.00021	0.13639	0.16034
HRS	<i>Clostridioides difficile</i> group	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Peptostreptococcaceae: Clostridioides	2.66469	0.00741	0.00019	0.13376
HRS	<i>Lachnospira pectinoschiza</i>	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Lachnospira	2.65509	0.00084	0.09974	0.14924
HRS	<i>Bifidobacterium dentium</i>	Species	Bacteria: Actinobacteria: Actinobacteria_c: Bifidobacteriales: Bifidobacteriaceae: Bifidobacterium	2.54838	7.04E-09	0.00051	0.07248
HRS	<i>Dorea formicigenerans</i>	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Dorea	2.49393	0.00794	0.02263	0.08328
HRS	<i>Hungatella effluvii</i>	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Hungatella	2.45944	0.01103	0.00058	0.04608

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhoiss groups
HRS	Ruminococcus faecis	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Ruminococcus_g4	2.42343	0.00225	0.07655	0.08618
HRS	Lactobacillus pontis	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	2.3893	0.00829	0	0.05514
HRS	Lactobacillus sakei group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	2.37697	5.41E-06	0.00245	0.04758
HRS	Campylobacter concisus group	Species	Bacteria: Proteobacteria: Epsilonproteobacteria: Campylobacterales: Campylobacteraceae: Campylobacter	2.3041	0.00007	0.00131	0.03482
HRS	Citrobacter amalonaticus group	Species	Bacteria: Proteobacteria: Gammaproteobacteria: Enterobacteriales: Enterobacteriaceae: Citrobacter	2.30243	0.00103	0.00033	0.0455
HRS	Pseudomonas aeruginosa group	Species	Bacteria: Proteobacteria: Gammaproteobacteria: Pseudomonadales: Pseudomonadaceae: Pseudomonas	2.18767	0.00303	0.00006	0.02818
HRS	Clostridium paraputrificum	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Clostridiaceae: Clostridium	2.13521	0.00211	0.00979	0.02947
HRS	Campylobacter gracilis	Species	Bacteria: Proteobacteria: Epsilonproteobacteria: Campylobacterales: Campylobacteraceae: Campylobacter	2.07533	2.49E-06	0.00062	0.0238
HRS	Streptococcus parasanguinis group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Streptococcaceae: Streptococcus	2.06341	0.02511	0.03373	0.03635
Non-HCC	Escherichia coli group	Species	Bacteria: Proteobacteria: Gammaproteobacteria: Enterobacteriales: Enterobacteriaceae: Escherichia	4.63187	0.0155	5.97096	13.38541
Non-HCC	Veillonella dispar	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	4.37085	0.00001	1.08723	5.59925

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhois groups
Non-HCC	Enterobacteriaceae group	Species	Bacteria: Proteobacteria: Gammaproteobacteria: Enterobacterales: Enterobacteriaceae: Enterobacteriaceae_g	4.25257	0.02383	0.8066	4.50506
Non-HCC	Veillonella atypica	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	4.02097	0.0051	0.13783	2.3647
Non-HCC	Staphylococcus aureus group	Species	Bacteria: Firmicutes: Bacilli: Bacillales: Staphylococcaceae: Staphylococcus	3.91164	0.01224	0.00031	1.49142
Non-HCC	Lactobacillus salivarius	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.87246	0.00002	0.02335	1.32471
Non-HCC	Ruminococcus gnavus	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Ruminococcus_g5	3.79391	1.52E-07	0.11865	1.45486
Non-HCC	Clostridium clostridioforme group	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Clostridium_g24	3.58661	0.00201	0.24295	1.28484
Non-HCC	Lactobacillus helveticus group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.56657	0.00007	0.00562	0.63582
Non-HCC	Veillonella parvula group	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	3.52707	0.00001	0.27363	1.03443
Non-HCC	Enterococcus faecium group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Enterococcaceae: Enterococcus	3.51205	7.90E-09	0.01075	0.687
Non-HCC	Hungatella_uc	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Hungatella	3.4775	0.00352	0.0326	0.52174
Non-HCC	Lactobacillus gasseri group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.46116	0.00015	0.00784	0.59606
Non-HCC	Lactobacillus fermentum	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.3938	4.98E-07	0.00073	0.5004

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhoiss groups
Non-HCC	Streptococcus pneumoniae group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Streptococcaceae: Streptococcus	3.37045	0.00003	0.02051	0.53837
Non-HCC	Enterococcus faecalis	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Enterococcaceae: Enterococcus	3.36357	0.00011	0.00063	0.47122
Non-HCC	Bacteroides stercoris	Species	Bacteria: Bacteroidetes: Bacteroidia: Bacteroidales: Bacteroidaceae: Bacteroides	3.22491	0.00155	0.70929	0.80757
Non-HCC	Megasphaera micronuciformis	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Megasphaera	3.20182	0.0023	0.01127	0.32779
Non-HCC	Prevotella melaninogenica	Species	Bacteria: Bacteroidetes: Bacteroidia: Bacteroidales: Prevotellaceae: Prevotella	3.17869	0.04983	0.00031	0.30817
Non-HCC	Fusobacterium varium group	Species	Bacteria: Fusobacteria: Fusobacteria_ c: Fusobacteriales: Fusobacteriaceae: Fusobacterium	3.15162	0.00187	0.12711	0.35905
Non-HCC	Lactobacillus sakei group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.14262	0.00018	0.00245	0.29417
Non-HCC	Bifidobacterium breve	Species	Bacteria: Actinobacteria: Actinobacteria_ c: Bifidobacteriales: Bifidobacteriaceae: Bifidobacterium	3.13934	0.03416	0.00072	0.29525
Non-HCC	Bacteroides caccae	Species	Bacteria: Bacteroidetes: Bacteroidia: Bacteroidales: Bacteroidaceae: Bacteroides	3.12515	0.02781	0.5895	0.69956
Non-HCC	Bacteroides xylanisolvens group	Species	Bacteria: Bacteroidetes: Bacteroidia: Bacteroidales: Bacteroidaceae: Bacteroides	3.12062	0.00368	0.55197	0.61844
Non-HCC	Streptococcus sinensis group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Streptococcaceae: Streptococcus	3.07791	0.01418	0.03559	0.2782
Non-HCC	Clostridium nexile	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Coprococcus_g2	3.01343	0.00001	0.02545	0.25032

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhois groups
Non-HCC	Granulicatella adiacens group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Aerococcaceae: Granulicatella	2.99099	1.70E-06	0.00665	0.24781
Non-HCC	Clostridium innocuum group	Species	Bacteria: Firmicutes: Erysipelotrichi: Erysipelotrichales: Erysipelotrichaceae: Longicatena	2.93517	6.94E-08	0.01312	0.18426
Non-HCC	Alistipes_uc	Species	Bacteria: Bacteroidetes: Bacteroidia: Bacteroidales: Rikenellaceae: Alistipes	2.899	0.00744	0.1574	0.17393
Non-HCC	Holdemanella biformis	Species	Bacteria: Firmicutes: Erysipelotrichi: Erysipelotrichales: Erysipelotrichaceae: Holdemanella	2.69619	0.01382	0.07084	0.09837
Non-HCC	Blautia wexlerae	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Blautia	2.68384	0.00002	0.13639	0.15474
Non-HCC	Lactobacillus paracasei group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	2.66231	0.0007	0.00228	0.0955
Non-HCC	Clostridioides difficile group	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Peptostreptococcaceae: Clostridioides	2.64966	0.00015	0.00019	0.10399
Non-HCC	Fusobacterium nucleatum group	Species	Bacteria: Fusobacteria: Fusobacteria_ c: Fusobacteriales: Fusobacteriaceae: Fusobacterium	2.6274	0.01078	0.00096	0.08224
Non-HCC	Clostridium ramosum	Species	Bacteria: Firmicutes: Erysipelotrichi: Erysipelotrichales: Erysipelotrichaceae: Clostridium_g6	2.57145	4.93E-08	0.09493	0.12593
Non-HCC	Streptococcus parasanguinis group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Streptococcaceae: Streptococcus	2.53889	0.00471	0.03373	0.11998
Non-HCC	Prevotella oris	Species	Bacteria: Bacteroidetes: Bacteroidia: Bacteroidales: Prevotellaceae: Prevotella	2.53544	0.00857	0	0.04508
Non-HCC	Anaeroglobus geminatus	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Megasphaera	2.52587	0.00068	0.00325	0.04698

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhoiss groups
Non-HCC	Parabacteroides distasonis	Species	Bacteria: Bacteroidetes: Bacteroidia: Bacteroidales: Porphyromonadaceae: Parabacteroides	2.52078	0.00147	0.11889	0.1659
Non-HCC	Clostridium symbiosum	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Clostridium_g35	2.39085	0.02049	0.04063	0.07925
Non-HCC	Veillonella_uc	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	2.38288	0.00008	0.013	0.06831
Non-HCC	Fusobacterium necrogenes group	Species	Bacteria: Fusobacteria: Fusobacteria_ c: Fusobacteriales: Fusobacteriaceae: Fusobacterium	2.37796	0.04539	0.01256	0.05816
Non-HCC	Bifidobacterium scardovii	Species	Bacteria: Actinobacteria: Actinobacteria_ c: Bifidobacteriales: Bifidobacteriaceae: Bifidobacterium	2.35816	0.02404	0	0.04412
Non-HCC	Haemophilus pittmaniae	Species	Bacteria: Proteobacteria: Gammaproteobacteria: Pasteurellales: Pasteurellaceae: Haemophilus	2.23359	0.04273	0.01929	0.04115
Non-HCC	Mitsuokella jalaludinii	Species	Bacteria: Firmicutes: Negativicutes: Selenomonadales: Selenomonadaceae: Mitsuokella	2.22657	0.00544	0.05095	0.05146
Non-HCC	Romboutsia timonensis	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Peptostreptococcaceae: Romboutsia	2.22531	0.00155	0.05772	0.07728
Non-HCC	Weissella confusa group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Leuconostocaceae: Weissella	2.21011	0.02021	0.00547	0.03834
Non-HCC	Senegalimassilia anaerobia	Species	Bacteria: Actinobacteria: Coriobacteriia: Coriobacteriales: Coriobacteriaceae: Senegalimassilia	2.1608	0.01304	0.01578	0.0367
Non-HCC	Romboutsia sedimentorum	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Peptostreptococcaceae: Romboutsia	2.14884	0.00634	0.00136	0.02739

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhoiss groups
Non-HCC	Hungatella effluvii	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Hungatella	2.12301	0.00053	0.00058	0.01932
Non-HCC	Ruminococcus lactaris	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Ruminococcus_g4	2.1219	1.45E-06	0.02653	0.03424
Non-HCC	Citrobacter koseri	Species	Bacteria: Proteobacteria: Gammaproteobacteria: Enterobacteriales: Enterobacteriaceae: Citrobacter	2.10921	0.01177	0.00332	0.02245
Non-HCC	Bifidobacterium dentium	Species	Bacteria: Actinobacteria: Actinobacteria_ c: Bifidobacteriales: Bifidobacteriaceae: Bifidobacterium	2.08354	1.44E-06	0.00051	0.02603
Non-HCC	Clostridium perfringens	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Clostridiaceae: Clostridium	2.05952	0.00295	0.00491	0.02737
Non-HCC	Prevotella buccae	Species	Bacteria: Bacteroidetes: Bacteroidia: Bacteroidales: Prevotellaceae: Prevotella	2.03765	0.01341	0.00303	0.02235
HCC	Veillonella dispar	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	4.21286	0.00005	1.08723	4.15626
HCC	Lactobacillus helveticus group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	4.02512	2.06E-06	0.00562	2.28616
HCC	Megamonas rupellensis group	Species	Bacteria: Firmicutes: Negativicutes: Selenomonadales: Selenomonadaceae: Megamonas	3.87698	0.00777	1.70233	1.78364
HCC	Veillonella atypica	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	3.86186	0.00096	0.13783	1.5836
HCC	Veillonella parvula group	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	3.73095	1.10E-06	0.27363	1.23433
HCC	Enterococcus faecium group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Enterococcaceae: Enterococcus	3.68663	0.00089	0.01075	1.15163

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhois groups
HCC	Lactobacillus gasseri group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.65454	0.012	0.00784	1.09962
HCC	Akkermansia muciniphila	Species	Bacteria: Verrucomicrobia: Verrucomicrobiae: Verrucomicrobiales: Akkermansiaceae: Akkermansia	3.59216	0.04144	0.68335	1.0998
HCC	Roseburia inulinivorans	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Roseburia	3.40849	8.15E-07	0.86995	0.91967
HCC	Streptococcus salivarius group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Streptococcaceae: Streptococcus	3.36919	0.01346	0.14088	0.57312
HCC	Streptococcus pneumoniae group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Streptococcaceae: Streptococcus	3.31179	0.00037	0.02051	0.40428
HCC	Lactobacillus salivarius	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.25597	0.00343	0.02335	0.46373
HCC	Megasphaera micronuciformis	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Megasphaera	3.21916	0.00029	0.01127	0.37355
HCC	Lactobacillus fermentum	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.19868	0.0005	0.00073	0.33275
HCC	Ruminococcus gnavus	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Ruminococcus_g5	3.14392	0.03653	0.11865	0.39445
HCC	Lactobacillus paracasei group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.09372	0.00395	0.00228	0.41189
HCC	Anaerostipes hadrus group	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Anaerostipes	3.06498	0.00696	0.16337	0.29555
HCC	Gemmiger formicilis group	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Ruminococcaceae: Subdoligranulum	3.02793	0.00009	0.55361	0.73813

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhois groups
HCC	Streptococcus sinensis group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Streptococcaceae: Streptococcus	2.92704	0.00204	0.03559	0.20574
HCC	Lachnospira pectinoschiza	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Lachnospira	2.89786	0.01214	0.09974	0.28068
HCC	Fusobacterium necrogenes group	Species	Bacteria: Fusobacteria: Fusobacteria_ c: Fusobacteriales: Fusobacteriaceae: Fusobacterium	2.89095	0.01677	0.01256	0.20108
HCC	Romboutsia timonensis	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Peptostreptococcaceae: Romboutsia	2.83951	0.00879	0.05772	0.21046
HCC	Streptococcus parasanguinis group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Streptococcaceae: Streptococcus	2.82635	0.0245	0.03373	0.15146
HCC	Clostridium perfringens	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Clostridiaceae: Clostridium	2.82149	0.00892	0.00491	0.13361
HCC	Anaeroglobus geminatus	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Megasphaera	2.78402	0.00285	0.00325	0.12132
HCC	Dorea longicatena	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Dorea	2.77715	0.0189	0.11671	0.15556
HCC	Clostridium nexile	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Coproccoccus_g2	2.76574	0.00877	0.02545	0.15366
HCC	Bifidobacterium dentium	Species	Bacteria: Actinobacteria: Actinobacteria_ c: Bifidobacteriales: Bifidobacteriaceae: Bifidobacterium	2.70914	0.00001	0.00051	0.13913
HCC	Clostridium ramosum	Species	Bacteria: Firmicutes: Erysipelotrichi: Erysipelotrichales: Erysipelotrichaceae: Clostridium_g6	2.69801	0.00009	0.09493	0.1107
HCC	Clostridioides difficile group	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Peptostreptococcaceae: Clostridioides	2.58388	0.04011	0.00019	0.07835

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhoiss groups
HCC	Granulicatella adiacens group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Aerococcaceae: Granulicatella	2.51808	0.00012	0.00665	0.07806
HCC	Lactobacillus mucosae	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	2.48724	0.02535	0.00169	0.06311
HCC	Fusobacterium nucleatum group	Species	Bacteria: Fusobacteria: Fusobacteria_ c: Fusobacteriales: Fusobacteriaceae: Fusobacterium	2.47838	0.0046	0.00096	0.0599
HCC	Dorea formicigenerans	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Dorea	2.45686	0.04643	0.02263	0.06294
HCC	Lactobacillus delbrueckii group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	2.38521	0.03796	0.00076	0.04602
HCC	Clostridium innocuum group	Species	Bacteria: Firmicutes: Erysipelotrichi: Erysipelotrichales: Erysipelotrichaceae: Longicatena	2.33025	0.00002	0.01312	0.05245
HCC	Ruminococcus faecis	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Ruminococcus_g4	2.24608	0.04703	0.07655	0.08129
HCC	Weissella confusa group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Leuconostocaceae: Weissella	2.17242	0.0156	0.00547	0.03182
HCC	Veillonella_uc	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	2.15057	8.57E-06	0.013	0.04059
HCC	Faecalimonas umbilicata	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Faecalimonas	2.03369	0.02114	0.00692	0.0417
Alive	Escherichia coli group	Species	Bacteria: Proteobacteria: Gammaproteobacteria: Enterobacterales: Enterobacteriaceae: Escherichia	4.52658	0.03742	5.97096	11.95674
Alive	Veillonella dispar	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	4.29888	0.00003	1.08723	4.90408

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhoiss groups
Alive	Veillonella atypica	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	3.83663	0.00372	0.13783	1.49961
Alive	Enterococcus faecium group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Enterococcaceae: Enterococcus	3.76509	8.24E-07	0.01075	1.11711
Alive	Lactobacillus helveticus group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.66694	8.60E-06	0.00562	0.92444
Alive	Ruminococcus gnavus	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Ruminococcus_g5	3.62748	0.00003	0.11865	0.9587
Alive	Lactobacillus salivarius	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.50239	0.00116	0.02335	0.68475
Alive	Streptococcus pneumoniae group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Streptococcaceae: Streptococcus	3.42095	4.48E-06	0.02051	0.47731
Alive	Streptococcus salivarius group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Streptococcaceae: Streptococcus	3.41499	0.0306	0.14088	0.64747
Alive	Veillonella parvula group	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	3.38772	4.89E-06	0.27363	0.76692
Alive	Lactobacillus gasseri group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.31913	0.00055	0.00784	0.45191
Alive	Megasphaera micronuciformis	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Megasphaera	3.29891	0.00198	0.01127	0.38066
Alive	Enterococcus faecalis	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Enterococcaceae: Enterococcus	3.2691	0.00149	0.00063	0.40603
Alive	Streptococcus sinensis group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Streptococcaceae: Streptococcus	3.07025	0.00093	0.03559	0.26188

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhoiss groups
Alive	Clostridium clostridioforme group	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Clostridium_g24	3.05137	0.00997	0.24295	0.35955
Alive	Granulicatella adiacens group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Aerococcaceae: Granulicatella	3.04004	7.45E-07	0.00665	0.20594
Alive	Lactobacillus fermentum	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.02428	0.00007	0.00073	0.24504
Alive	Bacteroides xylanisolvans group	Species	Bacteria: Bacteroidetes: Bacteroidia: Bacteroidales: Bacteroidaceae: Bacteroides	3.02176	0.0401	0.55197	0.64752
Alive	Lactobacillus mucosae	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	2.97594	0.03738	0.00169	0.18143
Alive	Clostridium nexile	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Coproccoccus_g2	2.96956	0.00001	0.02545	0.21644
Alive	Bifidobacterium adolescentis group	Species	Bacteria: Actinobacteria: Actinobacteria_ c: Bifidobacteriales: Bifidobacteriaceae: Bifidobacterium	2.95152	0.01849	0.20496	0.27474
Alive	Lactobacillus sakei group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	2.93047	0.00062	0.00245	0.18958
Alive	Streptococcus parasanguinis group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Streptococcaceae: Streptococcus	2.89681	0.00143	0.03373	0.16789
Alive	Romboutsia timonensis	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Peptostreptococcaceae: Romboutsia	2.82209	0.0123	0.05772	0.1746
Alive	Anaerostipes hadrus group	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Anaerostipes	2.80114	0.0015	0.16337	0.25399

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhois groups
Alive	Fusobacterium necrogenes group	Species	Bacteria: Fusobacteria: Fusobacteria_c: Fusobacteriales: Fusobacteriaceae: Fusobacterium	2.7924	0.01937	0.01256	0.15779
Alive	Lachnospira pectinoschiza	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Lachnospira	2.72175	0.00004	0.09974	0.15643
Alive	Mitsuokella jalaludinii	Species	Bacteria: Firmicutes: Negativicutes: Selenomonadales: Selenomonadaceae: Mitsuokella	2.66616	0.02411	0.05095	0.1299
Alive	Clostridium ramosum	Species	Bacteria: Firmicutes: Erysipelotrichi: Erysipelotrichales: Erysipelotrichaceae: Clostridium_g6	2.65957	2.57E-07	0.09493	0.11432
Alive	Clostridium innocuum group	Species	Bacteria: Firmicutes: Erysipelotrichi: Erysipelotrichales: Erysipelotrichaceae: Longicatena	2.61618	1.65E-07	0.01312	0.08566
Alive	Dorea longicatena	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Dorea	2.57995	0.00015	0.11671	0.11873
Alive	Rothia mucilaginos group	Species	Bacteria: Actinobacteria: Actinobacteria_c: Micrococcales: Micrococcaceae: Rothia	2.52298	0.02914	0.0008	0.05947
Alive	Fusobacterium nucleatum group	Species	Bacteria: Fusobacteria: Fusobacteria_c: Fusobacteriales: Fusobacteriaceae: Fusobacterium	2.48991	0.0155	0.00096	0.049
Alive	Clostridioides difficile group	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Peptostreptococcaceae: Clostridioides	2.48175	0.00179	0.00019	0.06587
Alive	Lactobacillus paracasei group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	2.40853	0.00216	0.00228	0.06345
Alive	Parabacteroides distasonis	Species	Bacteria: Bacteroidetes: Bacteroidia: Bacteroidales: Porphyromonadaceae: Parabacteroides	2.37556	0.00027	0.11889	0.13436

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhoiss groups
Alive	Anaeroglobus geminatus	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Megasphaera	2.35596	0.00116	0.00325	0.03685
Alive	Weissella confusa group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Leuconostocaceae: Weissella	2.28292	0.00236	0.00547	0.04133
Alive	Clostridium perfringens	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Clostridiaceae: Clostridium	2.27562	0.00338	0.00491	0.04479
Alive	Bifidobacterium scardovii	Species	Bacteria: Actinobacteria: Actinobacteria_ c: Bifidobacteriales: Bifidobacteriaceae: Bifidobacterium	2.24231	0.01246	0	0.03856
Alive	Dorea formicigenerans	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Dorea	2.16204	0.01043	0.02263	0.0481
Alive	Lactobacillus delbrueckii group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	2.13767	0.02083	0.00076	0.02883
Alive	Veillonella_uc	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	2.06168	0.00001	0.013	0.03587
Alive	Collinsella intestinalis group	Species	Bacteria: Actinobacteria: Coriobacteria: Coriobacteriales: Coriobacteriaceae: Collinsella	2.0388	0.01246	0	0.01865
Alive	Romboutsia sedimentorum	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Peptostreptococcaceae: Romboutsia	2.03143	0.02952	0.00136	0.02638
Dead	Veillonella dispar	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	4.26214	9.25E-06	1.08723	4.71701
Dead	Enterobacteriaceae group	Species	Bacteria: Proteobacteria: Gammaproteobacteria: Enterobacteriales: Enterobacteriaceae: Enterobacteriaceae_g	4.25993	0.00848	0.8066	4.476
Dead	Veillonella atypica	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	4.23122	0.00051	0.13783	3.29601
Dead	Staphylococcus aureus group	Species	Bacteria: Firmicutes: Bacilli: Bacillales: Staphylococcaceae: Staphylococcus	4.13527	0.01537	0.00031	2.80366

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhois groups
Dead	Lactobacillus helveticus group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	4.07848	0.00002	0.00562	3.10461
Dead	Veillonella parvula group	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	4.00574	9.04E-07	0.27363	2.20527
Dead	Lactobacillus gasseri group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	4.00553	0.01439	0.00784	2.01868
Dead	Lactobacillus salivarius	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.87943	0.00001	0.02335	1.44734
Dead	Akkermansia muciniphila	Species	Bacteria: Verrucomicrobia: Verrucomicrobiae: Verrucomicrobiales: Akkermansiaceae: Akkermansia	3.79478	0.00635	0.68335	1.23027
Dead	Lactobacillus fermentum	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.67016	6.61E-07	0.00073	0.90117
Dead	Ruminococcus gnavus	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Ruminococcus_g5	3.55146	0.01139	0.11865	0.76415
Dead	Streptococcus pneumoniae group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Streptococcaceae: Streptococcus	3.4149	0.01829	0.02051	0.44619
Dead	Lactobacillus paracasei group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	3.40352	0.00085	0.00228	0.82065
Dead	Roseburia inulinivorans	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Roseburia	3.26003	0.00002	0.86995	0.97772
Dead	Enterococcus faecium group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Enterococcaceae: Enterococcus	3.25777	0.00021	0.01075	0.37652
Dead	Bifidobacterium dentium	Species	Bacteria: Actinobacteria: Actinobacteria_ c: Bifidobacteriales: Bifidobacteriaceae: Bifidobacterium	3.21246	6.67E-10	0.00051	0.28833

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhoiss groups
Dead	Dialister invisus	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Dialister	3.20173	0.02021	0.34168	0.47552
Dead	Fusobacterium varium group	Species	Bacteria: Fusobacteria: Fusobacteria_ c: Fusobacteriales: Fusobacteriaceae: Fusobacterium	3.14267	0.04095	0.12711	0.47951
Dead	Megasphaera micronuciformis	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Megasphaera	3.09692	0.00007	0.01127	0.26692
Dead	Anaeroglobus geminatus	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Megasphaera	3.08901	0.00211	0.00325	0.22486
Dead	Clostridium innocuum group	Species	Bacteria: Firmicutes: Erysipelotrichi: Erysipelotrichales: Erysipelotrichaceae: Longicatena	3.04342	0.00011	0.01312	0.20482
Dead	Ruthenibacterium lactatiformans	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Ruminococcaceae: Ruthenibacterium	3.01767	0.00967	0.07559	0.20822
Dead	Roseburia intestinalis group	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Roseburia	2.99436	0.00001	0.27617	0.28094
Dead	Clostridium perfringens	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Clostridiaceae: Clostridium	2.9818	0.01279	0.00491	0.18965
Dead	Holdemanella biformis	Species	Bacteria: Firmicutes: Erysipelotrichi: Erysipelotrichales: Erysipelotrichaceae: Holdemanella	2.96328	0.02138	0.07084	0.15603
Dead	Clostridium ramosum	Species	Bacteria: Firmicutes: Erysipelotrichi: Erysipelotrichales: Erysipelotrichaceae: Clostridium_g6	2.91016	0.0003	0.09493	0.12895
Dead	Clostridioides difficile group	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Peptostreptococcaceae: Clostridioides	2.89369	0.00863	0.00019	0.16259
Dead	Fusobacterium nucleatum group	Species	Bacteria: Fusobacteria: Fusobacteria_ c: Fusobacteriales: Fusobacteriaceae: Fusobacterium	2.86589	0.00076	0.00096	0.13336

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhoiss groups
Dead	Raoultella planticola group	Species	Bacteria: Proteobacteria: Gammaproteobacteria: Enterobacterales: Enterobacteriaceae: Raoultella	2.76713	0.00754	0.02216	0.18452
Dead	Veillonella_uc	Species	Bacteria: Firmicutes: Negativicutes: Veillonellales: Veillonellaceae: Veillonella	2.73298	0.00007	0.013	0.10639
Dead	Blautia wexlerae	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Blautia	2.73004	0.00029	0.13639	0.1509
Dead	Bifidobacterium breve	Species	Bacteria: Actinobacteria: Actinobacteria_c: Bifidobacteriales: Bifidobacteriaceae: Bifidobacterium	2.69765	0.00111	0.00072	0.11224
Dead	Prevotella oris	Species	Bacteria: Bacteroidetes: Bacteroidia: Bacteroidales: Prevotellaceae: Prevotella	2.67449	0.01182	0	0.0833
Dead	Lachnospira pectinoschiza	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Lachnospira	2.6398	0.0009	0.09974	0.14129
Dead	Citrobacter amalonaticus group	Species	Bacteria: Proteobacteria: Gammaproteobacteria: Enterobacterales: Enterobacteriaceae: Citrobacter	2.50136	0.02687	0.00033	0.05169
Dead	Lactobacillus pontis	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	2.49561	0.01182	0	0.06288
Dead	Lactobacillus sakei group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	2.44318	0.00076	0.00245	0.0498
Dead	Clostridium spiroforme	Species	Bacteria: Firmicutes: Erysipelotrichi: Erysipelotrichales: Erysipelotrichaceae: Clostridium_g6	2.39671	0.04769	0.00133	0.04415
Dead	Hungatella effluvii	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Hungatella	2.30163	0.00426	0.00058	0.03445
Dead	Romboutsia timonensis	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Peptostreptococcaceae: Romboutsia	2.28857	0.00014	0.05772	0.06312

Supplementary Table 3. Continued

Group Name	Species Name	Taxon rank	Taxonomy	LDA effect size	P-value	Mean Abundance Ratio (%)	
						Healthy control	Cirrhoiss groups
Dead	Campylobacter concisus group	Species	Bacteria: Proteobacteria: Epsilonproteobacteria: Campylobacterales: Campylobacteraceae: Campylobacter	2.22904	0.00266	0.00131	0.03039
Dead	Anaerotignum lactatifermentans	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Anaerotignum	2.19295	0.03437	0.012	0.03226
Dead	Granulicatella adiacens group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Aerococcaceae: Granulicatella	2.13762	0.00378	0.00665	0.02899
Dead	Lactobacillus delbrueckii group	Species	Bacteria: Firmicutes: Bacilli: Lactobacillales: Lactobacillaceae: Lactobacillus	2.11394	0.00026	0.00076	0.02713
Dead	Dorea formicigenerans	Species	Bacteria: Firmicutes: Clostridia: Clostridiales: Lachnospiraceae: Dorea	2.06132	0.00098	0.02263	0.03177