

Deep Shotgun Metagenomic Sequencing (WGS)

Performed by CosmosID, the purpose of this testing was to identify and compare species of bacteria, fungi, and protists present in fish wastewater samples from BSA CC, BSA NH, and GFA. The top genera per kingdom or domain are recorded below.

BSA CC results reported 0.562 million bacterial read hits, 1,694 viral read hits, 6,006 protistal read hits, 14,130 fungal read hits, and 0.231 million dark matter bacterial read hits. Additional read hits were classified into other categories, such as phage-related, that were not relevant to this report. Of the viruses detected, 99.89% infect protists and bacteria.

Fish Brew Bold FLO results reported 0.531 million bacterial read hits, 3,726 viral read hits, 6,923 protistal read hits, 16,293 fungal read hits, and 0.167 million dark matter bacterial read hits. Additional read hits were classified into other categories, such as phage-related, that were not relevant to this report. Despite viral read hits, no species were identified.

Shotgun/Whole Genome Sequencing						
BSA CC February 2021 Results				Fish Brew Bold FLO December 2021 Results		
	Genera Name	Relative Abundance	Unique Matches Frequency	Genera Name	Relative Abundance	Unique Matches Frequency
Bacteria	<i>Polynucleobacter</i>	18.83%	168705	<i>Mycolicibacter</i>	28.61%	81262
	<i>Rhodanobacter</i>	12.06%	58858	<i>Candidatus Parcubacteria_u_g</i>	10.40%	2260
	<i>Mycobacterium</i>	6.11%	78413	<i>Rhodanobacter</i>	8.31%	47710
	<i>Betaproteobacteria_u_g</i>	6.01%	51956	<i>Mycobacterium</i>	6.81%	13719
	<i>Sulfuritalea</i>	5.01%	25691	<i>Metallibacterium</i>	6.36%	6176
	<i>Thiobacillus</i>	3.99%	18807	<i>Simplicispira</i>	6.15%	5656
Fungi	<i>Saccharomyces</i>	40.17%	148	<i>Cantharellus</i>	56.92%	3481
	<i>Onygenales_u_g</i>	22.16%	968	<i>Onygenales_u_g</i>	9.35%	245
	<i>Clavaria</i>	6.24%	364	<i>Brettanomyces</i>	8.75%	497
	<i>Ascochyta</i>	5.24%	261	<i>Fusarium</i>	5.05%	307
	<i>Cantharellus</i>	4.72%	435	<i>Tuber</i>	4.75%	256
	<i>Brettanomyces</i>	4.09%	391	<i>Puccinia</i>	4.03%	285

Protista	<i>Pseudoperonospora</i>	34.35%	452	<i>Pseudoperonospora</i>	47.60%	466
	<i>Reticulomyxa</i>	18.22%	474	<i>Acanthamoeba</i>	19.49%	174
	<i>Acanthamoeba</i>	12.38%	151	<i>Hammondia</i>	18.89%	151
	<i>Stylonychia</i>	9.55%	49	<i>Reticulomyxa</i>	9.81%	92
	<i>Paramecium</i>	9.11%	192	<i>Hyphochytrium</i>	4.21%	340
	<i>Hammondia</i>	7.66%	91			
Fish Brew Product(s): Fish Brew Bold FLO, Rise & Thrive, Trifecta						

BSA NH results reported 0.452 million read hits were identified as bacterial, 296 were viral, 4,249 were protistal, 12,458 were fungal, and 0.353 million were dark matter bacterial. Additional read hits were classified into other categories, such as phage-related, that were not relevant to this report. Despite 296 viral read hits, no species were identified.

Fish Brew Rise & Thrive results reported 0.476 million read hits were identified as bacterial, 2,494 were viral, 5,163 were protistal, 10,333 were fungal, and 0.116 million were dark matter bacterial. Additional read hits were classified into other categories, such as phage-related, that were not relevant to this report. Despite 2,494 viral read hits, no species were identified.

Shotgun/Whole Genome Sequencing						
BSA NH February 2021 Results				Fish Brew Rise & Thrive December 2021 Results		
	Genera Name	Relative Abundance	Unique Matches Frequency	Genera Name	Relative Abundance	Unique Matches Frequency
Bacteria	<i>Pseudomonas</i>	25.48%	87857	<i>Mycolicibacter</i>	31.86%	135169
	<i>Methylobacterium</i>	14.54%	47681	<i>Mycolicibacterium</i>	16.67%	15239
	<i>Nitrosomonas</i>	9.68%	45551	<i>Mycobacterium</i>	16.62%	10794
	<i>Acinetobacter</i>	5.98%	25450	<i>Gordonia</i>	7.57%	2417
	<i>Methanoregula</i>	3.97%	58624	<i>Rhodanobacter</i>	5.25%	4634
	<i>Candidatus</i>	3.94%	12248	<i>Rhodococcus</i>	4.43%	673

	<i>Parcubacteria_u_g</i>					
Fungi	<i>Morchella</i>	50.32%	2873	<i>Fusarium</i>	29.22%	1348
	<i>Onygenales_u_g</i>	21.89%	1201	<i>Cantharellus</i>	19.51%	783
	<i>Clavaria</i>	6.36%	460	<i>Brettanomyces</i>	12.28%	482
	<i>Saccharomyces</i>	5.12%	87	<i>Onygenales_u_g</i>	11.63%	253
	<i>Blastomyces</i>	3.66%	174	<i>Melampsora</i>	4.62%	166
	<i>Wickerhamiella</i>	3.00%	124	<i>Puccinia</i>	4.30%	207
Protista	<i>Pseudoperonospora</i>	57.01%	807	<i>Acanthamoeba</i>	48.22%	619
	<i>Reticulomyxa</i>	22.03%	364	<i>Pseudoperonospora</i>	21.25%	276
	<i>Stylonychia</i>	9.98%	79	<i>Physarum</i>	11.67%	215
	<i>Hammondia</i>	4.65%	56	<i>Hammondia</i>	10.76%	107
	<i>Trypanosoma</i>	3.54%	56	<i>Reticulomyxa</i>	5.50%	54
Fish Brew Product(s): Rise & Thrive, Trifecta						

GFA results reported 0.864 million read hits were identified as bacterial, 1,600 were viral, 12,717 were protistal, 36,212 were fungal, and 0.606 million were dark matter bacterial. Additional read hits were classified into other categories, such as phage-related, that were not relevant to this report. Of the viruses detected, 100% infect bacteria.

Fish Brew Trifecta results reported 0.261 million read hits were identified as bacterial, 2,381 were viral, 4,162 were protistal, 6,192 were fungal, and 0.110 million were dark matter bacterial. Additional read hits were classified into other categories, such as phage-related, that were not relevant to this report. Of the viruses detected, 100% infect bacteria.

Shotgun/Whole Genome Sequencing						
GFA February 2021 Results				Fish Brew Trifecta December 2021 Results		
	Genera Name	Relative Abundance	Unique Matches Frequency	Genera Name	Relative Abundance	Unique Matches Frequency
Bacteria	<i>Bacteroides</i>	19.84%	504098	<i>Gemmobacter</i>	21.76%	74616
	<i>Thauera</i>	9.03%	130656	<i>Rubrivivax</i>	16.67%	57436

	<i>Leptonema</i>	6.22%	104669	<i>Thiothrix</i>	17.11%	31316
	<i>Pseudomonas</i>	4.95%	29841	<i>Thauera</i>	16.19%	16250
	<i>Oenococcus</i>	4.59%	553	<i>Pseudomonas</i>	7.82%	3779
	<i>Aeromonas</i>	4.16%	5307	<i>Aequorivita</i>	7.60%	10592
Fungi	<i>Saccharomyces</i>	89.82%	232	<i>Onygenales_u_g</i>	33.77%	355
	<i>Onygenales_u_g</i>	5.05%	3032	<i>Cantharellus</i>	11.79%	230
	<i>Epichloe</i>	1.31%	1174	<i>Clavaria</i>	11.20%	166
	<i>Clavaria</i>	1.28%	1152	<i>Fusarium</i>	7.70%	158
	<i>Puccinia</i>	1.19%	629	<i>Puccinia</i>	5.71%	91
	<i>Lentinus</i>	0.77%	1536	<i>Lentinus</i>	5.23%	143
Protista	<i>Pseudoperonospora</i>	38.67%	2514	<i>Pseudoperonospora</i>	45.00%	302
	<i>Reticulomyxa</i>	32.65%	2011	<i>Reticulomyxa</i>	31.79%	298
	<i>Paramecium</i>	9.13%	440	<i>Acanthamoeba</i>	8.21%	87
	<i>Stylonychia</i>	8.35%	306	<i>Stylonychia</i>	5.30%	20
	<i>Ascogregarina</i>	4.46%	427	<i>Hammondia</i>	3.990%	39
Fish Brew Product(s): Trifecta						