Table S1. Description of DOMs in the co-digestion wastewater of sewage sludge and food waste revealed by SPME-GC/MS.

Number	Retention time (min)	Organic compounds	Molecular weight	Match (%)	Peak aera	Proportion (%)
1	1.756	Carbon disulfide	76	97	412496	0.39
2	2.005	Butyraldehyde	72	95	795682	0.76
3	8.239	2-Heptanone	114	96	1496634	1.42
4	9.772	6-Methylheptan-2-one	128	95	737834	0.70
5	10.276	1,1-Dimethoxyhexane	146	93	1257949	1.19
6	10.444	3-Octanone	128	91	1750606	1.66
7	10.543	2-Octanone	128	95	987355	0.94
8	10.703	3-Octanol	130	91	203858	0.19
9	10.873	α-Zingiberene	204	76	219534	0.21
10	11.051	1,4-Cineole	154	94	887321	0.84
11	11.244	D-Phenylalanine	165	74	809841	0.77
12	11.313	2-Ethylhexanol	130	95	2830425	2.69
13	11.400	1,8-Cineole	154	96	7443337	7.07
14	11.619	Ocimene quintoxide	154	95	2261283	2.15
15	11.844	3-Nonen-2-one	140	87	581789	0.55
16	11.884	α-Terpinene	136	89	494942	0.47
17	11.924	2-hydroxy-2,6-dimethyl-6-hepten-3-one	156	87	307469	0.29
18	12.032	Acetophenone	120	94	696262	0.66
19	12.120	(1α,2α,5α)-2-Methyl-5-(1-methyl ethyl) bicyclol [3.1.0] hex-2-ol	154	89	967155	0.92
20	12.160	p-Cresol	108	97	8261808	7.84
21	12.463	2-Nonanone	142	90	1887146	1.79
22	12.685	4-Thujanol	154	91	986993	0.94
23	12.777	Thujone	152	96	1641098	1.56
24	12.916	1,2,3,4-Tetramethyl -5methylene-1,3-cyclopentadiene	134	92	476900	0.45
25	12.975	4-Methylene-1-(1-methy ethyl)-bicyclol [3.1.0] hex-3-ol	152	83	3525428	3.35
26	13.091	trans-1-Methyl-4-(1-methy ethyl)-2-cyclohexen-1-ol	154	92	470484	0.45
27	13.273	1-Methyl-4-(1-methy ethyl)-3-cyclohexene-1-ol	154	86	478401	0.45
28	13.332	4-methylindan	132	86	425549	0.40
29	13.389	cis-1-Methyl-4-(1-methy ethyl) -2-cyclohexene-1-ol	154	93	254644	0.24
30	13.500	(-)-Camphor	152	83	3460257	3.28
31	13.621	L-Menthone	154	95	1634025	1.55
32	13.683	Methyl decanoate	186	73	573657	0.54

Table S1. (Continued.)

Number	Retention time (min)	Organic compounds	Molecular weight	Match (%)	Peak aera	Proportion (%)
33	13.721	3,6,6-Trimethyl-2-morphine alcohol	154	70	389623	0.37
34	13.768	Isomenthone	154	79	2478471	2.35
35	13.981	DL-menthol	156	93	722591	0.69
36	14.041	(-)-Terpinen-4-ol	154	95	17736434	16.83
37	14.124	Naphthalene	128	94	3483573	3.31
38	14.259	α-Terpineol	154	95	10439884	9.91
39	14.303	trans-2-Methyl-5-(1-methylethenyl)-cyclohexanone	152	91	731837	0.69
40	14.372	2-methyl-5-(1-methylethyl)-cyclohexanone	154	93	425330	0.40
41	14.623	4-(2-methoxypropyl)-1-methylcyclohex-1-ene	168	91	2110878	2.00
42	14.683	Terpinyl acetate	196	88	566095	0.54
43	15.073	5-Nitrouracil-1-phenyl-1-hexene-3-ol	221	71	171902	0.16
44	15.132	2-N-propylphenol	136	97	4732878	4.49
45	15.345	2,3,4a,5,6,7,8,8a-Octahydrospiro[naphthalene-1(4H),2'-[1,3]dioxolan]-4-one	210	75	270903	0.26
46	15.668	4-hydroxybenzohydrazide	156	75	325781	0.31
47	15.719	Indole	117	75	3988612	3.79
48	15.833	6-Ethyl-7-hydroxy-4-octen-3-one	170	71	425188	0.40
49	15.987	cis-4-Methoxycypressane	168	71	265617	0.25
50	16.216	Methyl methoxy(3-methoxyphenyl)acetate	210	76	248159	0.24
51	16.467	7-Methoxy-3,7-dimethyloctanal	186	88	1218890	1.16
52	16.859	Turnip alcohol	154	74	228895	0.22
53	16.983	5-Methyl-1,2,3,4- tetrasulfide	170	95	548107	0.52
54	17.043	3-Methylindole	131	95	2543919	2.41
55	17.851	3,5-Dimethylphenyl acetate	164	85	172603	0.16
56	18.032	2,5-Di-tert-butyl-1,4-benzoquinone	220	87	380548	0.36
57	18.139	2,6-Di-tert-butyl-1,4-benzoquinone	220	80	465586	0.44
58	19.155	Eleuthero	222	89	167133	0.16
59	24.868	Cyclic octa-atomic sulfur	256	95	897424	0.85

Table S2. Description of DOMs in the effluent of the hydrolytic/acidogenic tank revealed by SPME-GC/MS.

Number	Retention time (min)	Organic compounds	Molecular weight	Match (%)	Peak area	Proportion (%)
1	8.241	2-Heptanone	114	95	1058747	1.0759
2	8.577	2-Heptanol	116	95	575247	0.5846
3	9.771	6-Methyl-2-heptanone	128	95	615029	0.625
4	10.051	6-Methyl-2-heptanol	130	95	214839	0.2183
5	10.273	Hexanal dimethyl acetal	146	92	1802836	1.8321
6	10.445	3-Octanone	128	93	1976206	2.0082
7	10.54	sec-Octanone	128	95	1219899	1.2397
8	10.62	(±)-6-Methyl-5-heptenyl-2-ol	128	92	504835	0.513
9	10.696	3-Octanol	130	94	600200	0.6099
10	10.796	secoctanol	130	95	540262	0.549
11	10.871	4,4-Dimethyl-cyclohex-2-en-1-ol	126	77	410360	0.417
12	11.049	1,4-Eudesmanin	154	94	734389	0.7463
13	11.092	4-Methyl-3-(1-methylethylidene)-cyclohexene	136	91	229922	0.2336
14	11.243	1,3-Dithiane	120	76	984349	1.0003
15	11.317	2-(methyl)-aurinol	186	87	723698	0.7354
16	11.397	Eucalyptol	154	97	6687854	6.7962
17	11.617	2,2-dimethyl-5-(1-methyl-1-propenyl)tetrahydrofuran	154	95	1823599	1.8532
18	11.841	3-nonen-2-one	140	84	318372	0.3235
19	11.883	2,5-dimethyl-3-vinyl-1,4-hexadiene	136	79	723721	0.7354
20	11.921	2-Hydroxy-2,6-dimethyl-6-hepten-3-one	156	88	366826	0.3728
21	12.031	acetophenone	120	92	767901	0.7803
22	12.119	cis-β-pinoresinol	154	90	1496631	1.5209
23	12.195	2-Cyclopropyl-2-nitro-1-phenyl - ethanol	207	68	751461	0.7636
24	12.244	6-Methyl-5-octen-2-one	140	77	188930	0.192
25	12.46	2-nonanone	142	79	1745580	1.7739
26	12.675	(1a,2a,5.a)-2-methyl-5-(1-methylethyl)-bicyclo[3.1.0]hexan-2-ol	154	93	1327583	1.3491
27	12.773	Cliffordone	152	95	1506304	1.5307
28	12.971	[1S-(1a,3a,5a)]-4-methylene-1-(1-methylethyl)-bicyclo[3.1.0]hexan-3-ol	152	87	2891354	2.9382
29	13.087	trans-1-methyl-4-(1-methylethyl)-2-cyclohexen-1-ol	154	92	437476	0.4446
30	13.293	2-pentylcyclopentanone	154	90	357351	0.3631
31	13.387	cis-1-methyl-4-(1-methylethyl)-2-cyclohexen-1-ol	154	93	292104	0.2968
32	13.492	L-camphor	152	89	2774060	2.819
33	13.619	L-menthone	154	96	1883517	1.914

Table S2. (Continued)

Number	Retention time (min)	Organic compounds	Molecular weight	Match	number	Proportion (%)
34	13.765	Isomenthone	154	80	2325063	2.3627
35	13.849	8-Hydroxymenthol	172	87	691046	0.7022
36	13.983	DL-Menthol	156	94	890402	0.9048
37	14.043	(-)-4-terpinol	154	95	20031310	20.356
38	14.141	2-Isopropyl-5-methylanisole	164	75	2643933	2.6868
39	14.26	α-Pinoresinol	154	95	13181292	13.395
40	14.304	2-Methyl-5-(1-methylethenyl)cyclohexanone	152	90	1141242	1.1597
41	14.369	2-Methyl-5-(1-methylethyl)cyclohexanone	154	94	831572	0.845
42	14.435	2-Hydroxyethyl-3-oxo-butanoic acid	146	71	485636	0.4935
43	14.621	4-(2-methoxypropan-2-yl)-1-methylcyclohex-1-ene	168	92	2082547	2.1163
44	14.681	(. +/-.) -2-carene	136	91	448328	0.4556
45	15.132	2-Propylphenol	136	97	6333431	6.4361
46	15.241	Tetrahydrolinalool	158	83	231119	0.2349
47	15.344	3-[2-pentenyl]-4-methyl-tetrahydrofuran-2-one	168	76	386099	0.3924
48	15.667	7-Methoxy-3,7-dimethyloctanal	196	74	281135	0.2857
49	15.833	6-ethyl-7-hydroxy-4-octen-3-one	170	73	536392	0.5451
50	15.988	1-methoxy-3,5-dimethyl-cyclohexene	140	69	397779	0.4042
51	16.213	1,1-dimethyl-2-(1-methylethoxy)-3-(3-methyl-1-pentynyl)-cyclopropane	208	72	302145	0.307
52	16.465	8-methoxy-5,5,8trimethyl-3-nonen-2-one	212	83	1779578	1.8084
53	16.857	4-(2-methoxyprop-2-yl)-1-methylcyclohex-1-ene	168	79	374387	0.3805
54	17.041	3-Methylindole	131	96	3060208	3.1098
55	17.849	3-Cyclopentylpropionic acid,3,5-dimethylphenyl ester	246	87	248059	0.2521
56	18.029	2,5-Di-tert-butyl-1,4-benzoquinone	220	86	368641	0.3746
57	19.153	Elemiol	222	90	280805	0.2854
58	20.137	Hinokiol	222	91	326219	0.3315
59	21.308	4,6,6-trimethyl-2-(3-methylbutane-1,3-dienyl)-3-oxatricyclo[5.1.0.0(2,4)]octane	218	85	215454	0.2189

Table S3. Shared DOMs between the influent and the effluent of the hydrolytic/acidogenic tank revealed by SPME-GC/MS.

Number	Organic commpounds	Peak area		
		Influent	effluent	Change (%)
1	2-Heptanone	1496634	1058747	29
2	6-Methyl-2-heptanone	737834	615029	17
3	Hexanal dimethyl acetal	1257949	1802836	-43
4	3-Octanone	1750606	1976206	-13
5	3-Octanol	203858	600200	-194
6	1,4-Eudesmanin	887321	734389	17
7	Eucalyptol	7443337	6687854	10
8	2,2-dimethyl-5-(1-methyl-1-propenyl)tetrahydrofuran	2261283	1823599	19
9	3-nonen-2-one	581789	318372	45
10	2-Hydroxy-2,6-dimethyl-6-hepten-3-one	307469	366826	-19
11	acetophenone	696262	767901	-10
12	(1α,2α,5α)-2-methyl-5-(1-methylethyl)-bicyclo[3.1.0]hexan-2-ol	967155	1327583	-37
13	2-nonanone	1887146	1745580	8
14	Cliffordone	1641098	1506304	8
15	[1S-(1a,3a,5a)]-4-methylene-1-(1-methylethyl)-bicyclo[3.1.0]hexan-3-ol	3525428	2891354	18
16	trans-1-methyl-4-(1-methylethyl)-2-cyclohexen-1-ol	470484	437476	7
17	cis-1-methyl-4-(1-methylethyl)-2-cyclohexen-1-ol	254644	292104	-15
18	L-camphor	3460257	2774060	20
19	L-menthone	1634025	1883517	-15
20	Isomenthone	2478471	2325063	6
21	DL-Menthol	722591	890402	-23
22	(-)-4-terpinol	17736434	20031310	-13
23	α-Pinoresinol	10439884	13181292	-26
24	2-Methyl-5-(1-methylethenyl)cyclohexanone	425330	1141242	-168
25	4-(2-methoxypropan-2-yl)-1-methylcyclohex-1-ene	2110878	2082547	1
26	2-Propylphenol	4732878	6333431	-34
27	6-ethyl-7-hydroxy-4-octen-3-one	425188	536392	-26
28	7-methoxy-3,7-dimethyl-octanal	1218890	281135	77
29	3-Methylindole	2543919	3060208	-20
30	2,5-Di-tert-butyl-1,4-benzoquinone	380548	368641	3
31	Eleuthero	167133	280805	-68

Table S4. Description of DOMs in the effluent of the two-stage A/O process revealed by SPME-GC/MS.

Number	Retention (min)	Organic compounds	Molecular weight	Match (%)	Peak area	Proportion (%)
1	1.372	Ethylamine	45	76	4530	0.51
2	1.383	L-lactic acid	90	83	7676	0.87
3	1.391	Isopropanol	60	75	6167	0.70
4	2.572	Chloropicrin	163	92	135434	15.31
5	8.321	1,1,3-trimethoxypropane	134	95	240121	27.15
6	11.62	2,2-dimethyl-5-(1-methyl-1-propenyl) tetrahydrofuran	154	86	29538	3.34
7	12.715	Nonyl aldehyde	142	94	96937	10.96
8	13.233	2-Methyl-1,3-dioxolane-2-butanol	160	73	44946	5.08
9	14.175	lemon cyclic ether	154	67	59804	6.76
10	15.339	3-methoxy-2,3-dimethyl-1-butene	114	76	46791	5.29
11	15.832	2,4-dimethyl-1,3-cyclopentanedione	126	78	65106	7.36
12	15.980	2,5,5-trimethyl-3-hexyn-2-ol	140	74	74613	8.44
13	16.448	cis-6,7-diethyldecahydro-1,4-methanonaphthalene	206	74	31995	3.62
14	20.832	2,6,10-trimethyldodecane	212	88	40709	4.60

Table S5. Description of DOMs in the effluent of the ultrafiltration units revealed by SPME-GC/MS.

Number	Retention time (min)	Organic compounds	Molecular weight	Match (%)	Peak area	Proportion (%)
1	2.013	n-Butyl isocyanate acetate	157	92	84025	5.06
2	2.560	Chloropicrin	163	89	114642	6.90
3	8.301	1,1,3-trimethoxypropane	134	96	398405	23.97
4	12.705	Nonyl aldehyde	142	97	521770	31.39
5	13.228	2-Methyl-1,3-dioxolane-2-butanol	160	72	71366	4.29
6	14.169	lemon cyclic ether	154	71	71066	4.28
7	15.831	2,4-dimethyl-1,3-cyclopentanedione	126	77	97748	5.88
8	15.977	2,5,5-trimethyl-3-hexyn-2-ol	140	74	95116	5.72
9	16.444	5,5-dimethyl-3-(3-methyl-cyclooxiran-2-yl)-cyclohex-2-enone	180	77	112731	6.78
10	18.132	2,5-Di-tert-butyl-1,4-benzoquinone	220	75	95202	5.73