

Supplementary Table S1. Archived count-level cells used in the secondary analysis

This table lists the 45 complete 11°C treatment × CMC × storage-time cells used in the manuscript. Counts are pooled across the archived within-tube sections and technical subsamples. The table documents the numerical provenance of the descriptive secondary analysis and does not imply independent biological replication.

Treatment	CMC (%)	Month	Alive IJs	Dead IJs	Total counted	Survival (%)	Data status
Control	2	2	435	42	477	91.195	Complete 11°C cell
Control	2	4	404	43	447	90.380	Complete 11°C cell
Control	2	6	407	79	486	83.745	Complete 11°C cell
Control	3	2	450	53	503	89.463	Complete 11°C cell
Control	3	4	412	22	434	94.931	Complete 11°C cell
Control	3	6	145	99	244	59.426	Complete 11°C cell
Control	4	2	355	65	420	84.524	Complete 11°C cell
Control	4	4	285	28	313	91.054	Complete 11°C cell
Control	4	6	177	105	282	62.766	Complete 11°C cell
Formaldehyde	2	2	361	25	386	93.523	Complete 11°C cell
Formaldehyde	2	4	296	124	420	70.476	Complete 11°C cell
Formaldehyde	2	6	172	95	267	64.419	Complete 11°C cell
Formaldehyde	3	2	424	23	447	94.855	Complete 11°C cell
Formaldehyde	3	4	287	126	413	69.492	Complete 11°C cell
Formaldehyde	3	6	212	88	300	70.667	Complete 11°C cell
Formaldehyde	4	2	417	32	449	92.873	Complete 11°C cell
Formaldehyde	4	4	227	100	327	69.419	Complete 11°C cell
Formaldehyde	4	6	55	112	167	32.934	Complete 11°C cell
Methylparaben	2	2	247	18	265	93.208	Complete 11°C cell
Methylparaben	2	4	399	99	498	80.120	Complete 11°C cell
Methylparaben	2	6	47	198	245	19.184	Complete 11°C cell
Methylparaben	3	2	306	30	336	91.071	Complete 11°C cell
Methylparaben	3	4	388	99	487	79.671	Complete 11°C cell
Methylparaben	3	6	53	195	248	21.371	Complete 11°C cell
Methylparaben	4	2	253	25	278	91.007	Complete 11°C cell
Methylparaben	4	4	308	66	374	82.353	Complete 11°C cell

Treatment	CMC (%)	Month	Alive IJs	Dead IJs	Total counted	Survival (%)	Data status
Methylparaben	4	6	55	249	304	18.092	Complete 11°C cell
Sorbic acid	2	2	281	29	310	90.645	Complete 11°C cell
Sorbic acid	2	4	492	86	578	85.121	Complete 11°C cell
Sorbic acid	2	6	316	66	382	82.723	Complete 11°C cell
Sorbic acid	3	2	399	29	428	93.224	Complete 11°C cell
Sorbic acid	3	4	382	55	437	87.414	Complete 11°C cell
Sorbic acid	3	6	262	52	314	83.439	Complete 11°C cell
Sorbic acid	4	2	234	31	265	88.302	Complete 11°C cell
Sorbic acid	4	4	322	45	367	87.738	Complete 11°C cell
Sorbic acid	4	6	207	55	262	79.008	Complete 11°C cell
Yarrow extract	2	2	477	5	482	98.963	Complete 11°C cell
Yarrow extract	2	4	479	117	596	80.369	Complete 11°C cell
Yarrow extract	2	6	168	144	312	53.846	Complete 11°C cell
Yarrow extract	3	2	555	9	564	98.404	Complete 11°C cell
Yarrow extract	3	4	386	78	464	83.190	Complete 11°C cell
Yarrow extract	3	6	141	148	289	48.789	Complete 11°C cell
Yarrow extract	4	2	407	41	448	90.848	Complete 11°C cell
Yarrow extract	4	4	268	104	372	72.043	Complete 11°C cell
Yarrow extract	4	6	78	177	255	30.588	Complete 11°C cell

Supplementary Table S2. Section-specific six-month survival and rank sensitivity at 11°C

The three section labels correspond to beginning, middle and end portions of the selected source tube. They are technical sampling locations, not independent biological replicates. Rank columns are descriptive rankings among the 15 formulation × CMC combinations within each section.

Formulation	CMC (%)	Section 1 survival (%)	Section 2 survival (%)	Section 3 survival (%)	Pooled survival (%)	Max-min spread (pp)	Rank S1	Rank S2	Rank S3
Control	2	81.5	86.9	83.1	83.7	5.4	2	1	2
Sorbic acid	3	79.8	85.3	86.0	83.4	6.2	4	3	1
Sorbic acid	2	80.9	86.9	78.9	82.7	8.0	3	2	4
Sorbic acid	4	82.9	73.6	80.6	79.0	9.4	1	4	3
Formaldehyde	3	68.6	66.7	74.6	70.7	7.9	5	5	5
Formaldehyde	2	60.6	64.4	67.4	64.4	6.8	6	7	7
Control	4	51.3	65.3	68.9	62.8	17.6	9	6	6
Control	3	51.8	61.1	65.2	59.4	13.4	8	8	8
Yarrow extract	2	53.2	53.8	54.6	53.8	1.5	7	9	9
Yarrow extract	3	47.9	45.8	52.5	48.8	6.7	10	10	10
Formaldehyde	4	24.1	35.8	38.3	32.9	14.3	14	11	12
Yarrow extract	4	31.9	20.4	40.0	30.6	19.6	11	13	11
Methylparaben	3	29.3	21.8	14.0	21.4	15.4	12	12	13
Methylparaben	2	22.2	21.8	14.0	19.2	8.3	15	12	13
Methylparaben	4	24.8	15.0	13.7	18.1	11.1	13	14	14

Sensitivity summary: Pairwise Spearman rank concordance among the three section-specific month-6 rankings was 0.90, 0.92 and 0.96. Control + 2% CMC and sorbic acid at 2, 3 and 4% CMC occupied the top four positions in every section, although their internal order varied. These summaries assess positional robustness only and do not provide biological replication.