Supplementary Material

Figure S1. Moorings design and plate location.

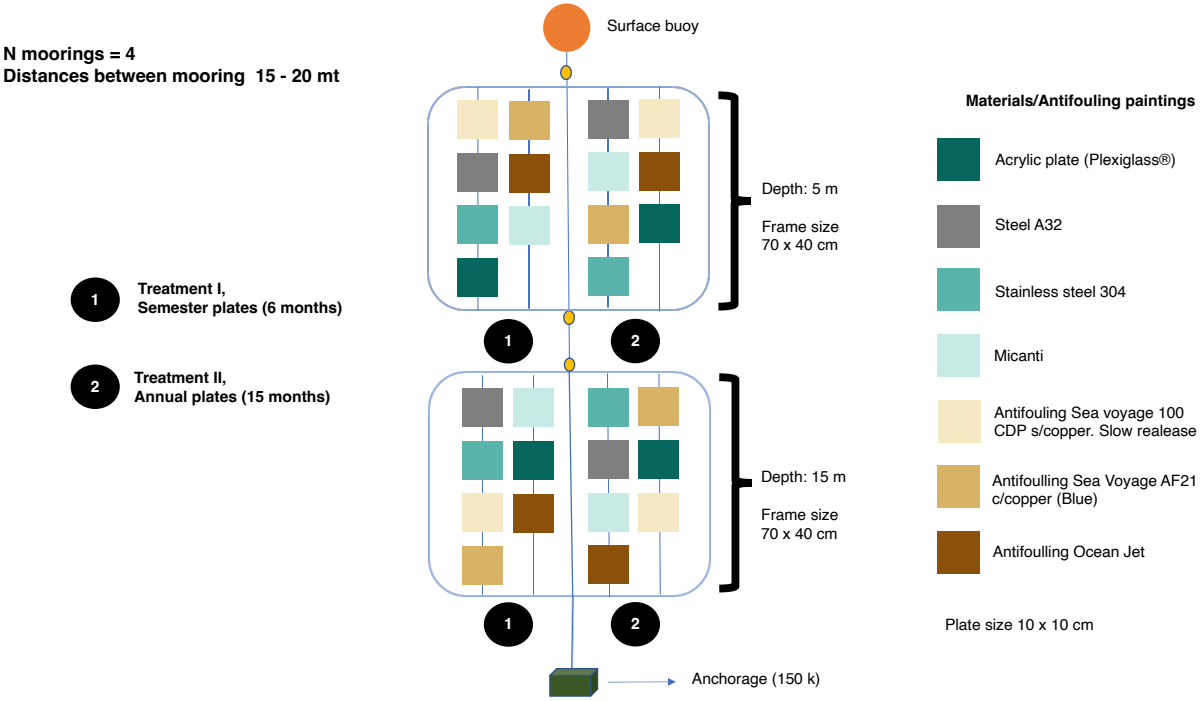
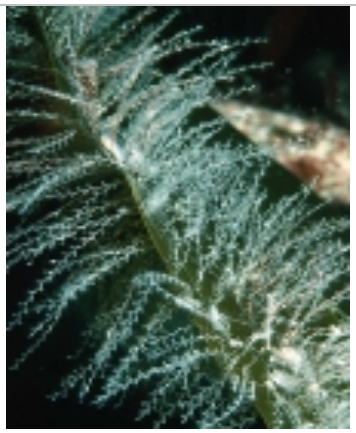


Table S1. Description of material and coating characteristics.

ID	Name	Treatment	Application	Material Compound or Technology	References or Link
Acrylic	Acrylic	Traditional material used in biofouling studies	Infrastructure		
Steel	Steel A32	Traditional material used in the shipping industry	Infrastructure		
Stainless steel	Stainless steel 304	Traditional material used in the shipping industry	Infrastructure		
Micanti	Micanti	"Eco-friendly" antifouling strategy	It is a self-adhesive film (not paint) that is applied to the hull of the vessel.	Nylon fiber, polyester film, and two-component water-based adhesive. Micanti doesn't contain any toxic ingredients.	www.micanti.com
CDP	SeaVoyage 100 CDP slow release	"Eco-friendly" antifouling painting	Microbiocide. Multi-site inhibitor (metabolic processes)	Copper oxide (Cu2O) micro-sized, tin-free. Slow-release technology.	www.sherwin.cl
AF21	SeaVoyage AF 21	Not eco-friendly antifouling painting	Microbiocide. Multi-site inhibitor (metabolic processes).	Copper oxide (Cu2O), tin-free.	www.sherwin.cl
OJ33	Ocean Jet 33	Not eco-friendly antifouling painting	Microbiocide. Multi-site inhibitor (metabolic processes).	Copper oxide (Cu2O)	http://www.jet.com.pe/es/

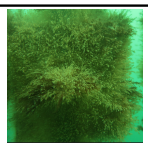
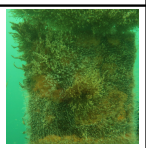
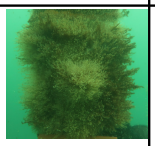
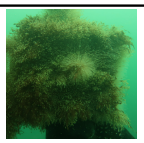
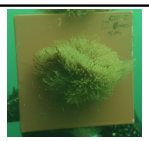
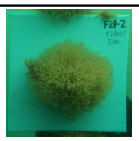
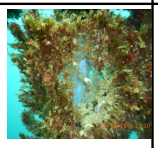
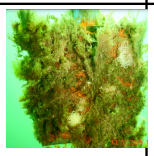
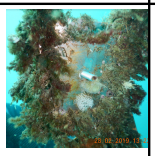
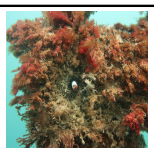
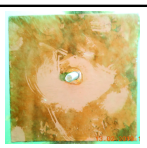
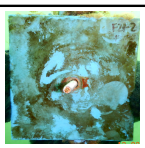
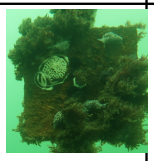
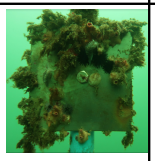
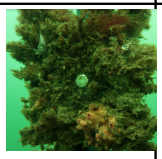
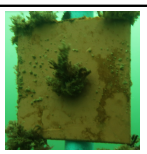
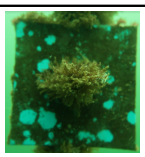
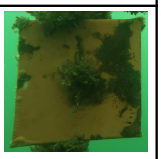
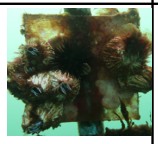
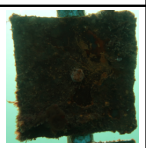
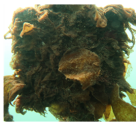
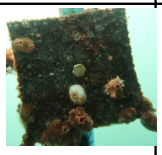
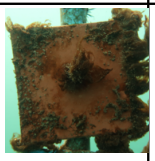
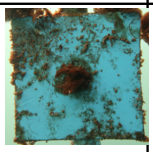
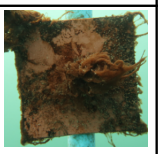
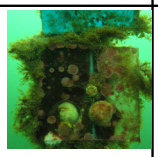
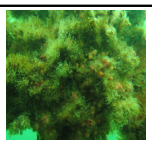
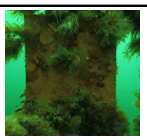
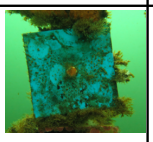
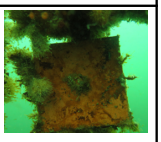
Table S2. Three main fouling organisms and annual photos

		
Obelia geniculata (Photo: **WoRMS**)	*Austromegabalanus psittacus* (Photo: Allie Tissot)	*Pyura chilensis* (Photo: **Benito Rosende** Flickr)

WoRMS: https://www.marinespecies.org/aphia.php?p=taxdetails&id=117388

Benito Rosende Flickr: **https://www.flickr.com/photos/benitofotos/9411344695**

5 m

DATE	Acrylic	Steel	Stainless steel	Micanti	CDP	F21	OJ33
Oct-18							
Feb-19							
Apr-19							
Sep-19							
Jan-20							

15 m

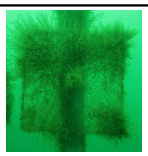
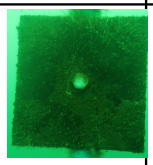
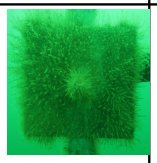
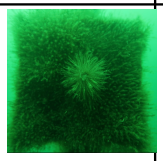
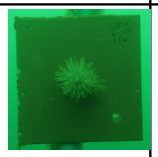
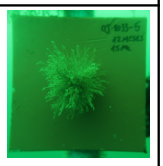
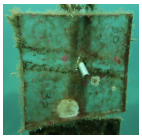
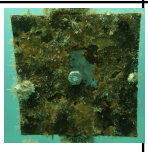
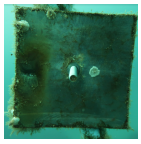
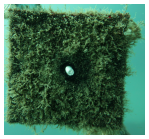
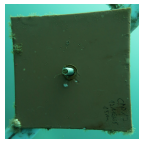
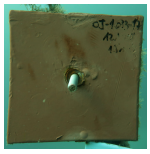
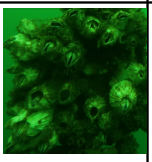
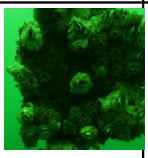
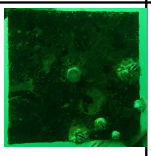
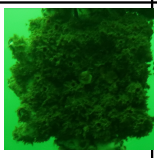
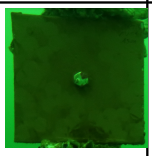
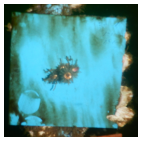
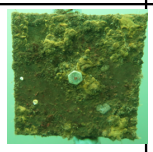
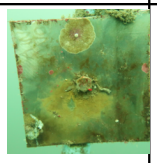
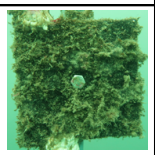
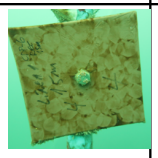
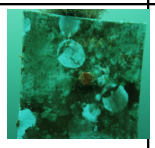
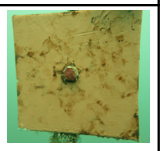
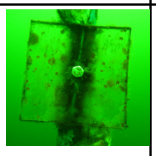
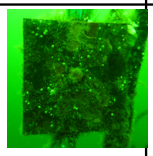
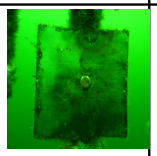
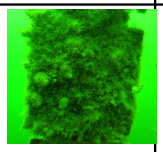
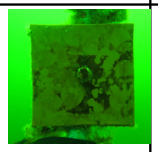
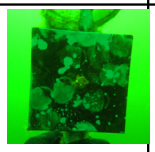
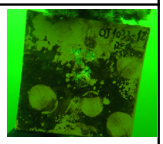
DATE	Acrylic	Steel	Stainless steel	Micanti	CDP	F21	OJ33
Oct-18							
Feb-19							
Apr-19							
Sep-19							
Jan-20							

Figure S2. Urchin recruitment from 1997 to 2019 in the study site. We quantified the settlement of urchins at Las Cruces using artificial collectors made of plastic mesh (Tuffy, Clorox Company, SOS, Oakland, California, USA). These collectors have been used extensively in recruitment studies of invertebrate species in Chile (e.g., Narváez et al. 2006, Lagos et al. 2007, Navarrete et al. 2008, Caro et al. 2010).

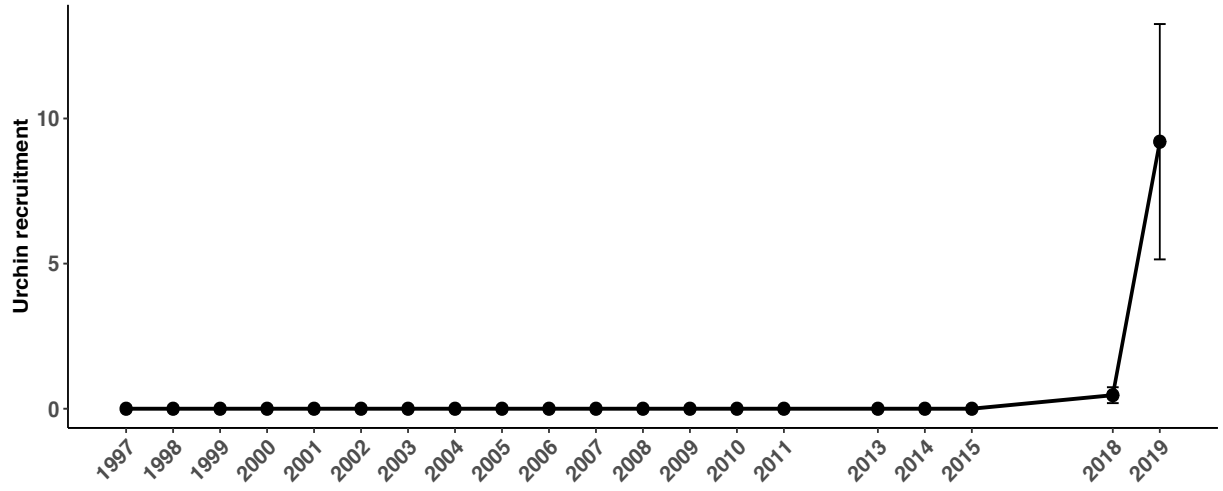


Table S3. (**a**) Maximum cover percentage (%) value of biofouling species by treatments reached during the experiment. (**b**) Maximum cover percentage value of oxide by treatments reached at any time of exposure during the experiment.

A.

Species	Acrylic	Steel	Stainless steel	Micanti	CDP	F21	OJ33
Biofilm	70	0	77	2	97	94	96
Obelia geniculata	100	100	100	100	15	6	18
Antithamnion densum	30	30	25	40	7	1	2
Austromegabalanus psittacus	73	73	94	0	11	5	4
Aulacomya ater	1	4	7	2	2	0	1
Hiatella solida	1	1	2	1	0	0	0
Verruca spp.	2	1	2	0	0	0	0
Corallina spp.	24	0	10	0	0	0	0
Heterosiphonia spp.	15	9	21	14	3	2	0
Corella eumyota	5	12	12	20	0	0	0
Ciona intestinalis	0	0	2	0	0	0	0
Pyura chilensis	22	16	90	100	0	0	0
Botryllus schlosseri	0	0	0	15	0	0	0
Kallymeniaceae	6	3	6	6	0	0	1
Adenocystis utricularis	2	1	1	0	0	0	0
Serpullidae	0	0	3	3	0	0	0
Bryozoa	13	14	24	1	0	0	0
Cellaria malvinensis	0	0	0	0	0	0	0
Leucosolenia spp.	6	4	15	20	0	0	0
Sycon spp.	2	5	3	5	5	0	0
Spirorbidae	2	4	2	0	0	0	0
Semimytilus algosus	2	2	3	1	0	1	0
Ceramium rubrum	2	1	0	2	0	0	0

B.

Item	Acrylic	Steel	Stainless steel	Micanti	CDP	F21	OJ33
Oxide	0	98	15	0	1	2	0

Figure S3. Mean biofouling biomass accumulation rates (g/day/100 cm^2 ± SE) in the 100 cm^2 steel and stainless-steel plates recorded during 15 months at the two depths of deployment. In September 2019, sea urchins were removed.

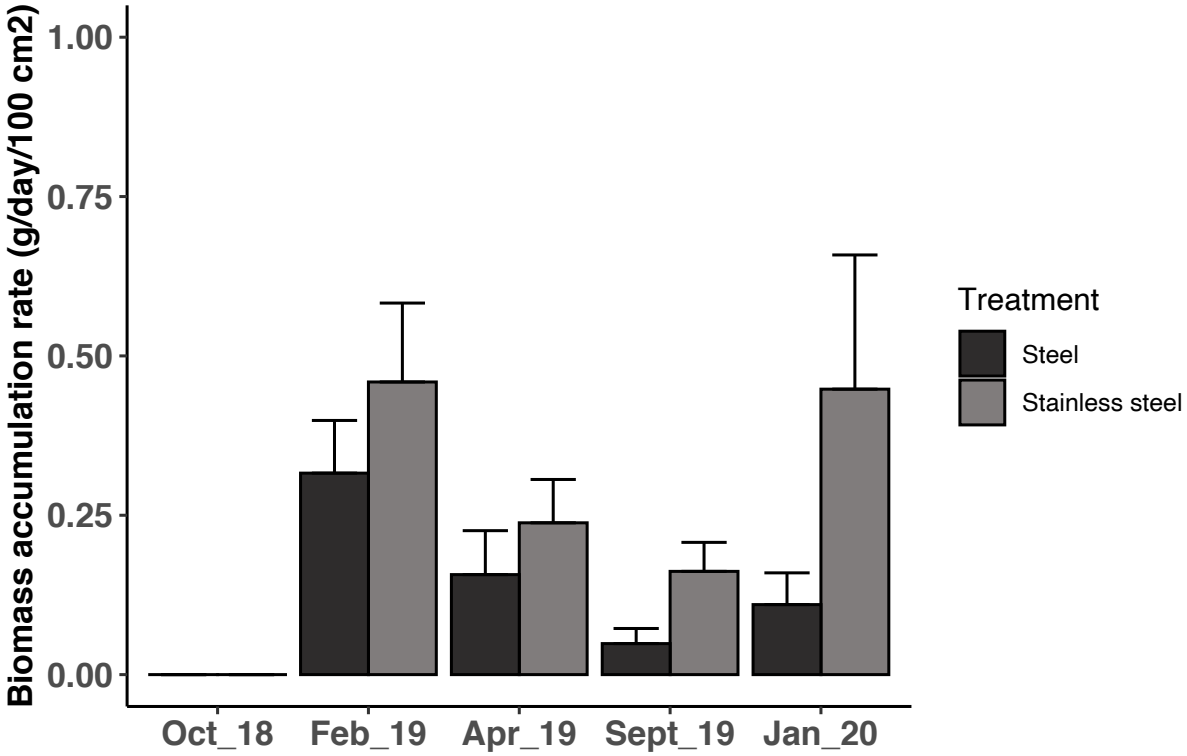


Table S4. *a priori* contrasts.

Table S4.1 Test of hypotheses regarding the effects on log-transformed mean biofouling biomass accumulation (g/100 cm^2) using linear *a priori* contrasts from Table 1. Plates recorded during 12 months before urchin removal. (*Semester: Six months*).

ANOVAs

Origin	Df	TYPE III SS	Mean square	F Value	Pr > F
Succession	2	433.3616318	216.6808159	240.72	<.0001
Treatment	5	363.5853607	72.7170721	80.78	<.0001
Depth	1	19.9855366	19.9855366	22.20	<.0001
Succession*Treatment	10	38.0161923	3.8016192	4.22	<.0001
Succession*Depth	2	0.8044836	0.4022418	0.45	0.6408
Treatment*Depth	5	5.2494490	1.0498898	1.17	0.3306
Succes*Treatme*Depth	10	12.9996661	1.2999666	1.44	0.1710

CONTRASTS

Contrast	Df	Contrast SS	Mean square	F Value	Pr > F
yearly vs semesters	1	105.6246606	105.6246606	117.34	<.0001
first vs second semester	1	330.6793987	330.6793987	367.37	<.0001
untreated vs treated	1	186.1015411	186.1015411	206.75	<.0001
Traditional vs Friendly	1	122.8206914	122.8206914	136.45	<.0001
CDP vs Micanti	1	152.7048074	152.7048074	169.65	<.0001
F21 vs OJ33	1	0.0115348	0.0115348	0.01	0.9101
yearly_untreated	1	4.8030274	4.8030274	5.34	0.0228
yearly_Traditional	1	0.0947595	0.0947595	0.11	0.7462
yearly_CDP-Mica	1	0.1187080	0.1187080	0.13	0.7172
Yearly_F21-OJ	1	0.1759781	0.1759781	0.20	0.6593
First_Untreated	1	28.2567041	28.2567041	31.39	<.0001
First_traditional	1	7.3228162	7.3228162	8.14	0.0052
Fisrt_CDP-Mica	1	2.8573337	2.8573337	3.17	0.0776
First_F21-OJ	1	0.0008192	0.0008192	0.00	0.9760

*Traditional: Traditional maritime industry materials
*Friendly: ”Eco-friendly”AF coating.
*Untreated: Materials without AF coatings.
* Treated: Materials with AF coatings.
** Interaction Succession*Treatment: contrasts: “Yearly vs Six months * Traditional vs “Eco-friendly”. If traditional material vs. ”Eco-friendly”AF differences are not similar to first and second six months and annuals treatments.

Table S4.2 Analyses of mean biofouling biomass accumulation (g/100 cm^2) with a two-way ANOVA randomized block design with traditional materials and AF treatments (acrylic, stainless steel, Micanti, CDP, F21, and OJ33) and depths (5 m, 15 m) as fixed factors, and mooring as a block. Mean biofouling biomass accumulation was square root transformed to obtain normality and homoscedasticity.

Linear *a priori* contrasts for treatments from Table 1, plates recording after urchin removal

Summary (ANOVA)

	Df	Sum Sq	Mean Sq.	F value	Pr(>F)
Treatment	5	3.668	0.7336	7.143	0.000558 ***
Depth	1	0.784	0.7841	7.635	0.011994 *
Mooring	2	0.114	0.0569	0.554	0.583075
Treatment:Depth	5	0.664	0.1328	1.293	0.305991
Residuals	20	2.054	0.1027		

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

TukeyHSD(aov1)

Tukey multiple comparisons of means
95% family-wise confidence level

Fit: aov(formula = sqrt_Biofouling_day ~ Treatment * Depth + Mooring, data = UrchinRemoval)

$Treatment

	diff	lwr	upr	p adj
Stainless steel-Acrylic	0.07966121	-0.5302809	0.689603342	0.9982656
Micanti-Acrylic	0.28720326	-0.3227389	0.897145399	0.6800087
CDP-Acrylic	-0.48574154	-1.1228053	0.151322244	0.2042591
F21-Acrylic	-0.51741958	-1.1273617	0.092522557	0.1267961
OJ33-Acrylic	-0.50739295	-1.1173351	0.102549189	0.1393688
Micanti-Stainless steel	0.20754206	-0.3740150	0.789099065	0.8666681
CDP-Stainless steel	-0.56540275	-1.1753449	0.044539390	0.0791928
F21-Stainless steel	-0.59708079	-1.1786378	-0.015523777	0.0420710
OJ33-Stainless steel	-0.58705415	-1.1686112	-0.005497145	0.0470464
CDP-Micanti	-0.77294480	-1.3828869	-0.163002667	0.0082420
F21-Micanti	-0.80462284	-1.3861799	-0.223065834	0.0036466
OJ33-Micanti	-0.79459621	-1.3761532	-0.213039202	0.0041172
F21-CDP	-0.03167804	-0.6416202	0.578264097	0.9999810
OJ33-CDP	-0.02165141	-0.6315935	0.588290729	0.9999971
OJ33-F21	0.01002663	-0.5715304	0.591583640	0.9999999

$Depth

	diff	lwr	upr	p adj
5 m deep-15 m deep	0.3029717	0.07329182	0.5326515	0.0123029

Table S5. (**1,2**) Biofouling mean cover percentage between acrylic, stainless steel, and Micanti treatments at 5 and 15 m analyses using repeated measures analysis of variance and checking for sphericity assumption with the Mauchly criteria. (**3**) Biofouling mean cover percentage by treatment at 5 and 15 m deep after sea urchin removal, using two-way ANOVA.

1. **Mauchly's test of sphericity**

	Effect	DFn	DFd	F	p	p<.05	ges
1	MonthYear.	1.33	6.	.65	2.601	0.152	0.253

2. **Repeated measures analysis of variance**

Error: Treatment_Depth

	Df	Sum Sq.	Mean Sq	F value	Pr(>F)
Residuals	5	2919	583.8		

Error: Treatment_Depth:MonthYear

	Df	Sum Sq	Mean Sq.	F value	Pr(>F)
Treatment_Depth (MonthYear)	3	2836	945.3	2.601	0.0905 .
Residuals	15	5452	363.5		

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

3. **Two-way analysis of variance after sea urchin removal**

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
Treatment	2	769.3	384.6	1.398	0.288
Depth	1	173.6	173.6	0.631	0.444
Treatment:Depth	2	1808.9	904.5	3.287	0.076 .
Residuals	11	3027.2	275.2		

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Table S6. Permutational analysis of variance (PERMANOVA) and *a posteriori* tests using false discovery rate (FDR) correction.

5 m after 12 months of exposure

PERMANOVA

Permutation: free, Number of permutations: 1000

	Df	SumsOfSqs	MeanSqs	F.Model	R2	Pr(>F)	
Treatment	5	11.037	2.20751	14.109	0.4749	0.000999	***
Residuals	78	12.204	0.15646		0.5251		
Total	83	23.242			1.0000		

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

A posteriori tests using False Discovery Rate (FDR) correction:

	pairs	Df	SumsOfSqs	F.Model	R2	p.value	p.adjusted	sig
1	Stainless steel vs Micanti	1	0.28421115	1.2912384	0.04126518	0.235	1.000	
2	Stainless steel vs Acrylic	1	0.12186656	0.5029241	0.01704658	0.676	1.000	
3	Stainless steel vs CDP	1	2.42643745	12.3939130	0.31461493	0.001	0.015	.
4	Stainless steel vs F21	1	3.20167828	18.9148088	0.42112634	0.001	0.015	.
5	Stainless steel vs OJ33	1	3.28895560	20.7532433	0.44388885	0.001	0.015	.
6	Micanti vs Acrylic	1	0.47145439	2.2735487	0.07269878	0.056	0.840	
7	Micanti vs CDP	1	4.02040560	25.4075677	0.48480723	0.001	0.015	.
8	Micanti vs F21	1	5.01163822	38.4668831	0.59669215	0.001	0.015	.
9	Micanti vs OJ33	1	5.04870874	42.2502832	0.61904920	0.001	0.015	.
10	Acrylic vs CDP	1	2.36358192	13.0853548	0.33478920	0.001	0.015	.
11	Acrylic vs F21	1	3.15661834	20.7054418	0.45301918	0.001	0.015	.
12	Acrylic vs OJ33	1	3.22497434	22.8344627	0.47736426	0.001	0.015	.
13	CDP vs F21	1	0.15476726	1.7195190	0.06956118	0.166	1.000	
14	CDP vs OJ33	1	0.22498858	2.8915266	0.11167849	0.038	0.570	
15	F21 vs OJ33	1	0.05425117	1.3193503	0.05657749	0.296	1.000	

15 m after 12 months of exposure

PERMANOVA

Permutation: free, number of permutations: 1000

	Df.	SumsOfSqs	MeanSqs	F.Model	R2	Pr(>F)	
Treatment	5	9.8803	1.97606	9.5206	0.38513	0.000999	***
Residuals	76	15.7742	0.20756	0.61487			
Total	81	25.6545	1.00000				

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

A posteriori tests using false discovery rate (FDR) correction:

Pairs	Df	SumsOfSqs	F.Model	R2	p.value	p.adjusted	sig
1 Stainless steel vs Micanti	1	1.72030459	10.2620427	0.25488132	0.001	0.015	.
2 Stainless steel vs acrylic	1	0.08848730	0.4182119	0.01374873	0.763	1.000	
3 Stainless steel vs CDP	1	1.84302684	6.7841574	0.20080884	0.001	0.015	.
4 Stainless steel vs F21	1	1.70993243	6.3755533	0.20320130	0.001	0.015	.
5 Stainless steel vs OJ33	1	1.99359317	9.4720812	0.28298453	0.001	0.015	.
6 Micanti vs acrylic	1	1.73227077	12.8959823	0.30063380	0.001	0.015	.
7 Micanti vs CDP	1	4.33845991	23.3472043	0.46372395	0.001	0.015	.
8 Micanti vs F21	1	3.98020172	22.6803438	0.47567492	0.001	0.015	.
9 Micanti vs OJ33	1	4.64104289	40.7475937	0.62932985	0.001	0.015	.
10 Acrylic vs CDP	1	2.23604251	9.5291131	0.26086352	0.001	0.015	.
11 Acrylic vs F21	1	1.97743071	8.6642803	0.25737310	0.001	0.015	.
12 Acrylic vs OJ33	1	2.22812051	13.1973117	0.35479208	0.001	0.015	.
13 CDP vs F21	1	0.09681821	0.3182363	0.01425903	0.862	1.000	
14 CDP vs OJ33	1	0.25042071	1.0435445	0.04734014	0.375	1.000	
15 F21 vs OJ33	1	0.34397035	1.4821457	0.07236282	0.229	1.000	

5 m after first 6 months

PERMANOVA

Permutation: free, number of permutations: 1000

	Df	SumsOfSqs	MeanSqs	F.Model	R2	Pr(>F)
Treatment	5	5.1966	1.03932	9.2102	0.523	0.000999 ***
Residuals	42	4.7394	0.11284		0.477	
Total	47	9.9360			1.000	

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

***A posteriori* tests using false discovery rate (FDR) correction:**

pairs	Df	SumsOfSqs	F.Model	R2	p.value	p.adjusted	sig
1 Stainless steel vs acrylic	1	0.03625591	0.3771099	0.02622988	0.893	1.000	
2 Stainless steel vs Micanti	1	0.05172457	0.5564654	0.03822806	0.712	1.000	
3 Stainless steel vs CDP	1	1.25841195	10.1538113	0.42038133	0.001	0.015	.
4 Stainless steel vs F21	1	1.42734180	10.5534697	0.42981582	0.001	0.015	.
5 Stainless steel vs OJ33	1	1.87624625	20.2808918	0.59160922	0.001	0.015	.
6 Acrylic vs Micanti	1	0.09632088	1.0949994	0.07254054	0.315	1.000	
7 Acrylic vs CDP	1	1.33628586	11.2342710	0.44519895	0.001	0.015	.
8 Acrylic vs F21	1	1.48810543	11.4240364	0.44934000	0.001	0.015	.
9 Acrylic vs OJ33	1	2.02940362	23.1864696	0.62351898	0.001	0.015	.
10 Micanti vs CDP	1	1.54951793	13.3858638	0.48878735	0.001	0.015	.
11 Micanti vs F21	1	1.77304116	13.9531064	0.49916121	0.001	0.015	.
12 Micanti vs OJ33	1	2.20689895	26.1679801	0.65146368	0.001	0.015	.
13 CDP vs F21	1	0.11786179	0.7457041	0.05057094	0.604	1.000	
14 CDP vs OJ33	1	0.19929744	1.7282304	0.10988079	0.149	1.000	
15 F21 vs OJ33	1	0.14308722	1.1299413	0.07468246	0.365	1.000	

15 m after first 6 months

PERMANOVA

Permutation: free, number of permutations: 1000

	Df	SumsOfSqs	MeanSqs	F.Model	R2	Pr(>F)	
Treatment	5	4.1238	0.82476	5.7899	0.43896	0.000999	***
Residuals	37	5.2706	0.14245		0.56104		
Total	42	9.3944			1.00000		

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

***A posteriori* tests using false discovery rate (FDR) correction:**

	pairs	Df	SumsOfSqs	F.Model	R2	p.value	p.adjusted	sig
1	Stainless steel vs Micanti	1	0.86830368	5.0037066	0.26330161	0.003	0.045	.
2	Stainless steel vs acrylic	1	0.08440122	0.5879166	0.04326760	0.717	1.000	
3	Stainless steel vs CDP	1	0.52457605	4.1838589	0.24347610	0.001	0.015	.
4	Stainless steel vs OJ33	1	0.62169312	4.6436207	0.26318978	0.006	0.090	
5	Stainless steel vs F21	1	1.19141803	10.3485863	0.46305328	0.001	0.015	.
6	Micanti vs acrylic	1	0.84141060	4.5440100	0.25900635	0.001	0.015	.
7	Micanti vs CDP	1	1.32209215	7.9171823	0.37850138	0.001	0.015	.
8	Micanti vs OJ33	1	1.53248474	8.7325824	0.40181982	0.001	0.015	.
9	Micanti vs F21	1	2.10018983	13.1093616	0.52209060	0.001	0.015	.
10	Acrylic vs CDP	1	0.60634758	4.5258209	0.27386361	0.004	0.060	
11	Acrylic vs OJ33	1	0.74378815	5.1946422	0.30210819	0.003	0.045	.
12	Acrylic vs F21	1	1.31506172	10.6420610	0.49173048	0.001	0.015	.
13	CDP vs OJ33	1	0.01555470	0.1259593	0.01038758	0.783	1.000	
14	CDP vs F21	1	0.38901932	3.8106316	0.25729028	0.064	0.960	
15	OJ33 vs F21	1	0.16737834	1.4926691	0.11948360	0.260	1.000	

5 m after second 6 months

PERMANOVA

Permutation: free, number of permutations: 1000

	Df	SumsOfSqs	MeanSqs	F.Model	R2	Pr(>F)	
Treatment	5	2.7322	0.54643	5.9119	0.63488	0.000999	***
Residuals	17	1.5713	0.09243		0.36512		
Total	22	4.3034			1.00000		

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

A posteriori tests using False Discovery Rate (FDR) correction:

	pairs	Df	SumsOfSqs	F.Model	R2	p.value	p.adjusted	sig
1	Stainless steel vs acrylic	1	0.04585633	0.3688149	0.06869577	0.866	1.00	
2	Stainless steel vs Micanti	1	0.87869705	5.4312564	0.47512331	0.032	0.48	
3	Stainless steel vs CDP	1	0.19527038	1.9609269	0.24631891	0.185	1.00	
4	Stainless steel vs F21	1	0.27090310	2.1465998	0.26349641	0.077	1.00	
5	Stainless steel vs OJ33	1	0.26616544	2.8031866	0.31842862	0.078	1.00	
6	Acrylic vs Micanti	1	1.00329648	8.0958392	0.61819934	0.026	0.39	
7	Acrylic vs CDP	1	0.29230753	5.9313322	0.54259921	0.036	0.54	

8	Acrylic vs F21	1	0.35942042	4.4249223	0.46949165	0.072	1.00
9	Acrylic vs OJ33	1	0.35717957	8.1685146	0.62030646	0.062	0.93
10	Micanti vs CDP	1	1.41331110	14.2411142	0.70357363	0.032	0.48
11	Micanti vs F21	1	1.37477230	10.9228561	0.64544992	0.026	0.39
12	Micanti vs OJ33	1	1.57168202	16.6118711	0.73465265	0.028	0.42
13	CDP vs F21	1	0.04513889	0.7090909	0.10569106	0.915	1.00
14	CDP vs OJ33	1	0.01388889	0.4285714	0.06666667	1.000	1.00
15	F21 vs OJ33	1	0.02430556	0.4117647	0.06422018	1.000	1.00

15 m after second 6 months

PERMANOVA

Permutation: free, number of permutations: 1000

	Df	SumsOfSqs	MeanSqs	F.Model	R2	Pr(>F)
Treatment	5	3.7649	0.75299	18.461	0.83682	0.000999 ***
Residuals	18	0.7342	0.04079		0.16318	
Total	23	4.4991			1.00000	

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

A posteriori **tests using false discovery rate (FDR) correction:**

	pairs	Df	SumsOfSqs	F.Model	R2	p.value	p.adjusted	sig
1	Stainless steel vs Micanti	1	1.019282e+00	1.349349e+01	6.922049e-01	0.034	0.510	
2	Stainless steel vs acrylic	1	2.274058e-01	3.713987e+00	3.823339e-01	0.092	1.000	
3	Stainless steel vs CDP	1	4.880322e-01	1.156922e+01	6.584936e-01	0.031	0.465	
4	Stainless steel vs F21	1	3.542592e-01	6.317868e+00	5.129027e-01	0.085	1.000	
5	Stainless steel vs OJ33	1	3.542592e-01	6.317868e+00	5.129027e-01	0.088	1.000	
6	Micanti vs acrylic	1	1.025271e+00	1.956587e+01	7.653121e-01	0.023	0.345	
7	Micanti vs CDP	1	1.899935e+00	5.696079e+01	9.047026e-01	0.032	0.480	
8	Micanti vs F21	1	1.636131e+00	3.463150e+01	8.523313e-01	0.035	0.525	
9	Micanti vs OJ33	1	1.636131e+00	3.463150e+01	8.523313e-01	0.029	0.435	
10	Acrylic vs CDP	1	9.894185e-01	5.194928e+01	8.964612e-01	0.034	0.510	
11	Acrylic vs F21	1	8.184431e-01	2.485044e+01	8.055133e-01	0.034	0.510	
12	Acrylic vs OJ33	1	8.184431e-01	2.485044e+01	8.055133e-01	0.024	0.360	
13	CDP vs F21	1	1.388889e-02	1.000000e+00	1.428571e-01	1.000	1.000	
14	CDP vs OJ33	1	1.388889e-02	1.000000e+00	1.428571e-01	1.000	1.000	
15	F21 vs OJ33	1	-2.502559e-18	-9.009212e-17	-1.501535e-17	1.000	1.000	

Table S7 Richness and diversity analyses.

A. Richness at 5 m

Kruskal-Wallis rank sum test, data: LogRichness by Treatment
Kruskal-Wallis chi-squared = 17.075, df = 5, p-value = 0.004359

Dunn (1964) Kruskal-Wallis multiple comparison, p-values adjusted with the Benjamini-Hochberg method.

	Comparison	Z	P.unadj	P.adj
1	Acrylic - CDP	1.914898555	0.055505442	0.10407270
2	Acrylic - F21	2.576940847	0.009967901	0.03737963
3	CDP - F21	0.680524537	0.496172391	0.67659872
4	Acrylic - Micanti	0.266217357	0.790071816	0.98758977
5	CDP - Micanti	-1.687062911	0.091591256	0.15265209
6	F21 - Micanti	-2.362951495	0.018130042	0.04532511
7	Acrylic - OJ33	2.707316431	0.006782957	0.05087218
8	CDP - OJ33	0.806659124	0.419862900	0.62979435
9	F21 - OJ33	0.123685139	0.901564579	0.96596205
10	Micanti - OJ33	2.495176470	0.012589450	0.03776835
11	Acrylic - Stainless steel	0.008236024	0.993428678	0.99342868
12	CDP - Stainless steel	-1.935374036	0.052944413	0.11345231
13	F21 - Stainless steel	-2.605743906	0.009167498	0.04583749
14	Micanti - Stainless steel	-0.262245777	0.793131963	0.91515227
15	OJ33 - Stainless steel	-2.737968881	0.006181993	0.09272989

B. Diversity (Shannon index) at 5 m

Kruskal-Wallis rank sum test, data: SqrShannon by Treatment
Kruskal-Wallis chi-squared = 34.765, df = 5, p-value = 1.676e-06

Dunn (1964) Kruskal-Wallis multiple comparison, p-values adjusted with the Benjamini-Hochberg method.

	Comparison	Z	P.unadj	P.adj
1	Acrylic - CDP	2.39283034	0.0167189702	0.0358263647
2	Acrylic - F21	3.86170546	0.0001125983	0.0016889739
3	CDP - F21	1.47109975	0.1412641440	0.2118962159
4	Acrylic - Micanti	0.20512746	0.8374725406	1.0000000000
5	CDP - Micanti	-2.23088362	0.0256888389	0.0428147315
6	F21 - Micanti	-3.72343380	0.0001965314	0.0005895942
7	Acrylic - OJ33	3.79112369	0.0001499672	0.0007498362
8	CDP - OJ33	1.40281393	0.1606723326	0.2190986354
9	F21 - OJ33	-0.06695975	0.9466137439	0.9466137439
10	Micanti - OJ33	3.65185081	0.0002603571	0.0006508928
11	Acrylic - Stainless steel	0.10529718	0.9161400010	1.0000000000
12	CDP - Stainless steel	-2.32697185	0.0199667634	0.0374376814
13	F21 - Stainless steel	-3.81738647	0.0001348728	0.0010115461
14	Micanti - Stainless steel	-0.10148048	0.9191690505	0.9848239827
15	OJ33 - Stainless steel	-3.74580348	0.0001798173	0.0006743150

C. Richness at 15 m

Welch's Heteroscedastic F Test (alpha = 0.05)
data : X2Richness and Treatment
statistic : 7.416837
num df : 5
denom df : 35.10782
p.value : 7.772825e-05
Result : Difference is statistically significant.

games_howell_test(indices, X2Richness ~ Treatment, conf.level = 0.95, detailed = FALSE)
# A tibble: 15 × 8

	.y.	group1	group2	estimate	conf.low	conf.high	p.adj	p.adj.signif
1	X2Richness	Acrylic	CDP	-1.55	-2.63	-0.459	0.003	**
2	X2Richness	Acrylic	F21	-1.61	-2.70	-0.513	0.002	**
3	X2Richness	Acrylic	Micanti	-0.844	-2.08	0.396	0.326	ns
4	X2Richness	Acrylic	OJ33	-1.42	-2.51	-0.328	0.007	**
5	X2Richness	Acrylic	Stainless steel	-0.312	-1.70	1.08	0.982	ns
6	X2Richness	CDP	F21	-0.0594	-0.566	0.448	0.999	ns
7	X2Richness	CDP	Micanti	0.702	-0.137	1.54	0.136	ns
8	X2Richness	CDP	OJ33	0.127	-0.379	0.633	0.966	ns
9	X2Richness	CDP	Stainless steel	1.23	0.154	2.31	0.02	*
10	X2Richness	F21	Micanti	0.761	-0.0858	1.61	0.095	ns
11	X2Richness	F21	OJ33	0.186	-0.339	0.712	0.867	ns
12	X2Richness	F21	Stainless steel	1.29	0.208	2.38	0.014	*
13	X2Richness	Micanti	OJ33	-0.575	-1.42	0.271	0.312	ns
14	X2Richness	Micanti	Stainless steel	0.531	-0.703	1.77	0.774	ns
15	X2Richness	OJ33	Stainless steel	1.11	0.0226	2.19	0.044	*

D. Diversity (Shannon index) at 15 m

Kruskal-Wallis rank sum test, data: SqShannon by Treatment
Kruskal-Wallis chi-squared = 20.26, df = 5, p-value = 0.001117

Dunn (1964) Kruskal-Wallis multiple comparison
p-values adjusted with the Benjamini-Hochberg method.

	Comparison	Z	P.unadj	P.adj
1	Acrylic - CDP	3.14967213	0.0016345379	0.01225903
2	Acrylic - F21	3.32058076	0.0008983036	0.01347455
3	CDP - F21	0.30394685	0.7611683811	0.81553755
4	Acrylic - Micanti	2.66953894	0.0075955465	0.02848330
5	CDP - Micanti	-0.62198140	0.5339540978	0.72811922
6	F21 - Micanti	-0.91086555	0.3623662182	0.60394370
7	Acrylic - OJ33	2.40210311	0.0163011128	0.04075278
8	CDP - OJ33	-0.49391097	0.6213690554	0.71696429
9	F21 - OJ33	-0.76045988	0.4469797406	0.67046961

10 Micanti - OJ33 0.06076258 0.9515482958 0.95154830
11 Acrylic - Stainless steel 0.59490431 0.5519074389 0.68988430
12 CDP - Stainless steel -2.58637857 0.0096990339 0.02909710
13 F21 - Stainless steel -2.78357794 0.0053762944 0.02688147
14 Micanti - Stainless steel -2.07463464 0.0380204095 0.08147231
15 OJ33 - Stainless steel -1.88033752 0.0600620929 0.11261642