

Microplastics contamination in pearl-farming lagoons of French Polynesia

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Table S1. Summary of study site characteristics and sampling conditions.

	Study site		
	Ahe	Manihi	Takaroa
<i>Atoll characteristics</i>			
Emerged land (km ²)	12	13	20
Population (nb. of inhabitants)	491	650	674
Population density (inh. km ⁻²)	41	50	34
Tourist activity (people in transit/year)	4,500	4,000	3,500
Lagoon surface (km ²)	145	165	89
Water residence time (days)	34	130	76
Pearl-farming marine concessions (ha)	831	413	392
Lagoon surface area covered by marine concessions (%)	5.6	2.5	4.4
Collecting stations (nb. of units)	1,536	498	887
Reported pearl production in 2019 (nb. of units – tons)	884,743 – 1.14	307,757 – 0.37	181,095 – 0.20
<i>Sampling conditions</i>			
Sampling time	March 2018	March 2018	November 2017
Season	Warm	Warm	Warm
Wind conditions (km h ⁻¹)	10-15	10-15	15-20

Table S2. Microplastic concentrations in surface water (335 μm -mesh), water column (40 μm -mesh) and cultivated pearl oyster ($> 20 \mu\text{m}$) from Ahe, Manihi and Takaroa.

Study site	Sample	Total particle	Synthetic matter (%)	Total MP	Filtered volume (m^{-3})	MP concentration (item m^{-3})	Corrected MP concentration according to Kukulka et al. (2012)
<i>Surface water</i>							
Ahe	1	290	27.9	81	152.1	0.5	
Ahe	2	455	57.8	263	147.1	1.8	
Ahe	3	1672	61.9	1035	124.3	8.3	
Ahe	4	480	73.9	355	141.5	2.5	
Ahe	5	679	69.0	469	145.4	3.2	
Ahe	6	153	78.6	120	150.0	0.8	
Ahe	7	257	37.2	96	143.0	0.7	
Ahe	8	929	78.0	725	143.0	5.1	
Ahe	9	297	74.4	221	143.0	1.5	
Ahe	Pass (in)	1108	67.4	747	116.5	6.4	
Ahe	Pass (out)	369	78.6	290	151.3	1.9	
Manihi	1	290	53.8	156	132.8	1.2	
Manihi	2	523	33.3	174	169.6	1.0	
Manihi	3	400	43.9	176	157.5	1.1	
Manihi	4	428	60.5	259	167.3	1.5	
Manihi	5	688	46.3	319	163.9	1.9	
Manihi	6	714	55.8	399	149.8	2.7	
Manihi	7	652	83.3	543	65.1	8.4	
Manihi	8	1216	59.5	724	164.0	4.4	
Manihi	9	811	74.4	604	157.5	3.8	
Manihi	Pass (in)	952	41.9	399	84.3	4.7	
Manihi	Pass (out)	1163	32.6	379	75.5	5.0	
Takaroa	1	230	52.5	121	216.6	0.6	783.3
Takaroa	2	311	58.8	183	151.7	1.2	1,694.0
Takaroa	3	899	72.1	648	203.2	3.2	4,479.8
Takaroa	4	118	48.8	58	225.5	0.3	359.0
Takaroa	5	795	30.8	245	194.0	1.3	1,771.0
Takaroa	6	184	44.6	82	223.2	0.4	516.4
Takaroa	7	263	41.8	110	150.1	0.7	1,028.9
Takaroa	8	183	34.0	62	139.5	0.4	627.5
Takaroa	9	73	36.4	27	153.2	0.2	243.4
Takaroa	Pass (in)	221	33.3	74	184.1	0.4	562.1
Takaroa	Pass (out)	194	35.6	69	135.0	0.5	717.8
<i>Water column (sampling depth)</i>							
Ahe	1 (14 m)	478	60.5	289	1.3	217.2	
Ahe	2 (18 m)	698	37.2	260	1.7	151.8	
Ahe	3 (40 m)	422	NA	NA	3.8	NA	

Ahe	4 (30 m)	803	26.7	214	2.9	75.1
Ahe	5 (49 m)	169	61.0	103	4.7	22.1
Ahe	6 (39 m)	453	53.5	242	3.7	65.4
Ahe	7 (42 m)	311	54.5	170	4.0	42.5
Ahe	8 (54 m)	344	45.2	156	5.1	30.3
Ahe	9 (39 m)	472	44.2	209	3.7	56.3
Manihi	1 (28 m)	764	18.6	142	2.7	53.4
Manihi	2 (27 m)	680	20.0	136	2.6	53.0
Manihi	3 (43 m)	715	15.9	114	4.1	27.8
Manihi	4 (35 m)	708	60.0	425	3.3	127.7
Manihi	5 (37 m)	1008	32.6	328	3.5	93.3
Manihi	6 (36 m)	982	38.1	374	3.4	109.3
Manihi	7 (40 m)	1420	20.9	297	3.8	78.2
Manihi	8 (46 m)	1156	30.2	349	4.4	79.9
Manihi	9 (40 m)	1139	43.5	495	3.8	130.2
Takaroa	1 (15 m)	965	20.9	202	1.4	141.6
Takaroa	2 (8 m)	1271	42.9	545	0.8	716.2
Takaroa	3 (18 m)	833	31.7	264	1.7	154.3
Takaroa	4 (45 m)	521	30.2	158	4.3	36.8
Takaroa	5 (20 m)	463	25.0	116	1.9	60.9
Takaroa	6 (45 m)	708	22.7	161	4.3	37.6
Takaroa	7 (35 m)	381	12.2	46	3.3	14.0
Takaroa	8 (35 m)	287	32.6	93	3.3	28.1
Takaroa	9 (25 m)	276	19.5	54	2.4	22.7

Pearl oyster

					Dry weight (dw, g)	MP concentration (item g⁻¹ standardized dw)
Ahe (pearl-farm 1)	1	129	9.8	13	4.5	2.8
Ahe (pearl-farm 1)	2	117	28.9	34	3.4	10.0
Ahe (pearl-farm 1)	3	133	19.0	25	3.9	6.5
Ahe (pearl-farm 1)	4	271	2.3	6	1.8	3.5
Ahe (pearl-farm 1)	5	393	22.5	88	2.1	41.9
Ahe (pearl-farm 1)	6	56	9.5	5	1.3	4.2
Ahe (pearl-farm 1)	7	63	17.1	11	1.3	8.1
Ahe (pearl-farm 2)	8	94	23.7	22	5.2	4.3
Ahe (pearl-farm 2)	9	104	13.9	14	3.8	3.8
Ahe (pearl-farm 2)	10	109	20.0	22	7.7	2.8
Ahe (pearl-farm 2)	11	76	17.1	13	4.0	3.2
Ahe (pearl-farm 2)	12	90	32.3	29	4.5	6.4
Ahe (pearl-farm 2)	13	100	13.2	13	5.0	2.6
Ahe (pearl-farm 2)	14	156	16.2	25	5.3	4.7
Manihi	1	665	31.7	211	1.7	125.0
Manihi	2	450	32.5	146	3.3	44.8
Manihi	3	224	9.8	22	3.8	5.7
Manihi	4	275	27.5	76	2.0	37.1
Manihi	5	1176	32.4	381	3.4	113.2
Manihi	6	751	19.4	146	3.1	47.6

Manihi	7	258	34.2	88	3.4	26.2
Manihi	8	449	48.5	218	4.2	52.4
Manihi	9	373	22.9	85	3.8	22.4
Manihi	10	346	40.6	141	2.9	48.9
Manihi	11	441	20.0	88	4.2	21.2
Manihi	12	370	33.3	123	5.6	22.0
Manihi	13	260	19.5	51	5.0	10.0
Manihi	14	263	57.5	151	5.9	25.6
Takaroa (pearl-farm 1)	1	598	24.4	146	2.7	54.2
Takaroa (pearl-farm 1)	2	369	26.2	97	2.3	41.1
Takaroa (pearl-farm 1)	3	355	25.6	91	3.1	29.6
Takaroa (pearl-farm 1)	4	135	8.7	12	3.7	3.2
Takaroa (pearl-farm 1)	5	139	23.3	32	3.6	9.0
Takaroa (pearl-farm 1)	6	161	16.3	26	1.7	15.5
Takaroa (pearl-farm 1)	7	382	13.6	52	3.6	14.5
Takaroa (pearl-farm 2)	8	153	22.7	35	1.2	28.6
Takaroa (pearl-farm 2)	9	112	15.4	17	1.1	15.5
Takaroa (pearl-farm 2)	10	85	12.8	11	1.5	7.3
Takaroa (pearl-farm 2)	11	81	18.2	15	0.6	25.2
Takaroa (pearl-farm 2)	12	94	4.7	4	2.1	2.1
Takaroa (pearl-farm 2)	13	89	9.5	8	0.9	9.1
Takaroa (pearl-farm 2)	14	138	4.9	7	0.9	7.3

Table S3. Results of quality controls performed *in situ*.

Study site	Sampling station	Fragments (item)	Fibres (item)	Total (item)	Total identified by spectroscopy (item)	Synthetic fragments (item)	Synthetic fibres (item)	Synthetic fragments (%)	Synthetic fibres (%)	Synthetic particles among total identified (%)	Total synthetic particles in control sample (item)	Synthetic particle in corresponding <i>in situ</i> samples (item)	Ratio (%)
Ahe	1-2-3	54	0	54	43	6 PE (black, n=1; orange, n=1); Polyacrylate styrene (black, n=1); PP (grey, n=2); PU (brown, n=1)	0	100.0	0.0	14.0	7.5	1929.7	0.4
Ahe	4-5-6	159	10	169	36	12 PE (grey, n=2); Polyacrylate styrene (brown, n=1); PP (pink, n=4; brown, n=1); PU (orange, n=1); Polyester (red, n=2; blue, n=1)	0	100.0	0.0	33.3	56.3	1504.6	3.7
Ahe	7-8-9	65	5	70	39	4 PE (grey, n=3; blue, n=1)	0	100.0	0.0	10.3	7.2	1573.0	0.5
Manihi	1-2-3	111	11	122	43	6 PE (blue-green; n=1); PA (grey; n=4); Polyisoprene (grey; n=1)	0	100.0	0.0	14.0	17.0	900.8	1.9
Manihi	4-5-6	77	5	82	43	2 PE (grey, black; n=2)	1 PET (blue, n=1)	66.7	33.3	7.0	5.7	2093.9	0.3
Manihi	7-8-9	43	11	54	36	6 PA (white, n=1; yellow, n=1); Polyester (brown, n=1; black, n=1); PP (transparent, n=1; red, n=1)	2 Polyester (red, n=1; blue, n=1)	75.0	25.0	22.2	12.0	3005.7	0.4
Takaroa	1-2-3	0	0	0	0	0	0	0.0	0.0	0.0	0.0	1967.5	0.0
Takaroa	4-5-6	27	5	32	32	0	1 Polyester (red, n=1)	0.0	100.0	3.1	0.1	819.2	0.0
Takaroa	7-8-9	2	1	3	0	0	0	0.0	0.0	0.0	0.0	394.4	0.0

Table S4. Results of blank quality controls performed in the lab.

Blank	Corresponding <i>in situ</i> samples	Fragments (item)	Fibres (item)	Total (item)	Total identified by spectroscopy (item)	Synthetic fragments (item)	Synthetic fibres (item)	Synthetic fragments (%)	Synthetic fibres (%)	Synthetic particles from total identified (%)	Total synthetic particles in control sample (item)	Synthetic particles in corresponding <i>in situ</i> samples (item)	Ratio (%)
1	Ahe/PO/1-2-3-4	29	21	50	43	2 Olefin (grey, n=1); EVA (green, n=1)	1 PVCA (red, n=1)	66.7	33.3	7.0	3.5	650.0	0.5
2	Ahe/PO/5-6-7-8	17	14	31	31	3 EVA (beige, n=1); PE (blue, n=1; green, n=1)	1 Polyester (transparent, n=1)	75.0	25.0	12.9	4.0	606.0	0.7
3	Ahe/PO/9-10-11-12-13-14	11	7	18	15	6 PP (black; n=2); PE (grey; n=3); PE-PP (grey; n=1)	0	100.0	0.0	40.0	7.2	635.0	1.1
4	Ahe/SW/1-2-3-4-5-6-7-8-9-pass and Manihi/SW/1	211	4	215	43	0	0	0.0	0.0	0.0	0.0	6979.0	0.0
5	Ahe/WC/5-6-7-8-9 and Manihi/WC/1	90	6	96	43	7 PE (green, n=1); EVA (grey, n=1); PE (grey, n=1); PE (brown, n=1); Styrene polyacrylate (yellow, n=1); PS (black, n=1); POM (grey, n=1)	3 Polyester (red, n=1); PE-PP (grey, n=1); PP (yellow, n=1)	70.0	30.0	23.3	22.3	4845.0	0.5
6	Ahe/WC/1-2-3-4 and Manihi/SW/pass	2	2	4	-	-	-	-	-	-	-	-	-
7	Manihi/SW/2-3-4-5-6-7	1	1	2	-	-	-	-	-	-	-	-	-
8	Manihi/SW/8-9	9	1	10	-	-	-	-	-	-	-	-	-
9	Manihi/WC/2-3-4-5-6-7	4	1	5	-	-	-	-	-	-	-	-	-
10	Manihi/WC/8-9	0	0	0	-	-	-	-	-	-	-	-	-
11	Manihi/PO/1-2	65	5	70	36	11 PMMA (yellow, n=1; red, n=1); PA	1 PET (pink, n=1)	91.7	8.3	33.3	23.3	1115.0	2.1

						(black, n=1; white, n=1); PE (black, n=1; beige, n=1); PET (black, n=2); PP (black, n=2); EVA (black, n=1)								
12	Manihi/PO/3-4	64	5	69	39	8 PA (white, n=1); PE (beige, n=2; black, n=1; white, n=1); Epoxy resin (purple, n=1); EVA (blue, n=1)	1 Acrylic (red, n=1)	88.9	11.1	23.1	15.9	499.0	3.2	
13	Manihi/PO/5-6-7-8	58	8	66	42	3 PET (beige, n=1; orange, n=1); PU (black, n=1)	0	100.0	0.0	7.1	4.7	2634.0	0.2	
14	Manihi/PO/9-10-11-12-13	42	5	47	40	3 Polyester (beige, n=1); PE-PP (black, n=1); PET (black, n=1)	5 PET (blue, n=2; black, n=1; red, n=1); Nitrile rubber containing PVC (green, n=1)	37.5	62.5	20.0	9.4	1790.0	0.5	
15	Manihi/PO/14	39	5	44	30	5 Polyacrylamide (beige, n=1; transparent, n=1); EVA (black, n=3)	1 PET (blue, n=1)	83.3	16.7	20.0	8.8	263.0	3.3	
16	Takaroa/SW/1-2-3	37	38	75	36	4 PA (grey, n=1); PS (grey, n=1); EVA (pink, n=1); PEC (grey, n=1)	4 Polyester (orange, n=2; beige, n=1); PE (grey, n=1)	50.0	50.0	22.2	16.7	1440.0	1.2	
17	Takaroa/SW/4-5-6	12	4	16	16	2 EVA (black, n=1); PE-PP (black, n=1)	0	100.0	0.0	12.5	2.0	1097.0	0.2	
18	Takaroa/SW/7-8-9	2	3	5	-	-	-	-	-	-	-	-	-	
19	Takaroa/SW/pass	0	0	0	-	-	-	-	-	-	-	-	-	
20	Takaroa/WC/1-6	2	0	2	-	-	-	-	-	-	-	-	-	
21	Takaroa/WC/2-3-4	6	0	6	-	-	-	-	-	-	-	-	-	

22	Takaroa/WC/5-7-8-9	1	0	1	-	-	-	-	-	-	-	-	-
23	Takaroa/PO/1-2-3	3	0	3	-	-	-	-	-	-	-	-	-
24	Takaroa/PO/4-5-6-7	1	0	1	-	-	-	-	-	-	-	-	-
25	Takaroa/PO/8-9	38	9	47	40	8 PEC (black, n=1); EVA (black, n=3); Acrylic (black, n=1); PP (black, n=1); PE (black, n=2)	2 Polyester (orange, n=1); EVA (red, n=1)	80.0	20.0	25.0	11.8	265.0	4.4
26	Takaroa/PO/10-11	19	3	22	22	9 EVA (black, n=4); PE (yellow, n=1; brown, n=1); Polyisoprene (orange, n=2), PVC (brown, n=1)	0	100.0	0.0	40.9	9.0	166.0	5.4
27	Takaroa/PO/12-13-14	31	4	35	27	6 PVC (grey, n=6)	0	100.0	0.0	22.2	7.8	321.0	2.4

Table S5. Particles identified by spectroscopy in surface water samples (manta trawl, 335 μm) according to study site and their relative abundance. A total of 1,571 particles was analysed based on a sub-sampling procedure (Kedzierski et al., 2019).

Polymer*	Ahe		Manihi		Takaroa	
	Identified particles (item)	Relative abundance (%)	Identified particles (item)	Relative abundance (%)	Identified particles (item)	Relative abundance (%)
<i>Plastic</i>						
Acrylic	16	3.4	22	4.8	0	0.0
EVA	0	0.0	0	0.0	0	0.0
PA	0	0.0	8	1.7	23	4.0
Polyester	23	4.8	33	7.2	92	16.0
PE	119	25.0	93	20.2	91	15.8
PE-PP	7	1.5	10	2.2	12	2.1
Polyisoprene	11	2.3	0	0.0	9	1.6
PP	22	4.6	33	7.2	18	3.1
PU	48	10.1	6	1.3	0	0.0
PS	38	8.0	24	5.2	10	1.7
PVC	0	0.0	9	2.0	0	0.0
Other plastics	24	5.0	7	1.5	6	1.0
<i>Non-plastic</i>						
Cotton	15	3.2	18	3.9	79	13.7
Lignin/Cellulose	25	5.3	39	8.5	28	4.9
Mineral compounds	0	0.0	0	0.0	0	0.0
Pigment	16	3.4	44	9.6	16	2.8
Protein	9	1.9	11	2.4	30	5.2
Stearate	0	0.0	0	0.0	14	2.4
Other non-plastics	55	11.6	57	12.4	62	10.8
<i>Non-identifiable</i>	48	10.1	46	10.0	86	14.9
Total	476	100.0	460	100.0	576	100.0

EVA: ethylene-vinyl acetate; PA: polyamide; Polyester (including polyethylene terephthalate, PET); PE: polyethylene; PP: polypropylene; PS: polystyrene (mostly styrene copolymer based), PU: polyurethane, PVC: polyvinyl chloride.

*Excluding the polymer rayon

Table S6. Relative abundance of synthetic polymers among certified microplastics in surface water samples (manta trawl, 335 μm).

Polymer*	Ahe		Manihi		Takarua	
	Identified particles (item)	Relative abundance (%)	Identified particles (item)	Relative abundance (%)	Identified particles (item)	Relative abundance (%)
Acrylic	16	5.2	22	9.0	0	0.0
EVA	0	0.0	0	0.0	4	1.5
PA	2	0.6	8	3.3	23	8.5
Polyester	23	7.5	33	13.5	92	34.1
PE	119	38.6	93	38.0	91	33.7
PE-PP	7	2.3	10	4.1	12	4.4
Polyisoprene	11	3.6	3	1.2	9	3.3
PP	22	7.1	33	13.5	18	6.7
PU	38	12.3	24	9.8	10	3.7
PS	48	15.6	6	2.4	1	0.4
PVC	1	0.3	9	3.7	2	0.7
Other plastics	21	6.8	4	1.6	8	3.0
Total	308	100.0	245	100.0	270	100.0

EVA: ethylene-vinyl acetate; PA: polyamide; Polyester (including polyethylene terephthalate, PET); PE: polyethylene; PP: polypropylene; PS: polystyrene (mostly styrene copolymer based), PU: polyurethane, PVC: polyvinyl chloride.

*Excluding the polymer rayon

Table S7. Microplastic colour distribution and predominant polymer types among sample types.

	Microplastic colour						
	Black/grey	Blue	Red	Yellow	Orange	Brown	Other
<i>Surface water</i>							
Ahe	89	53	14	59	10	29	39
Manihi	138	35	21	14	9	13	15
Takaroa	72	28	54	13	9	11	34
Total	299	116	89	86	28	53	88
Predominant polymer types (%)	PE (44.5%); PP (15.7%); PE-PP (7.4%); PS (8.4%); Others (24.1%)	PE (44.0%); Polyester (19.0%); Acrylic (16.4%); Others (20.7%)	Polyester (56.2%); PE (28.0%); Others (15.7%)	PU (53.5%); PS (10.5%); Others (36.0%)	Polyisoprene (53.6%); PE (21.4%); Polyester (17.9%); Others (7.1%)	PS (52.8%); Polyester (11.3%); PA (9.4%); Others (26.4%)	-
Relative abundance (mean ± SD)	39.8 ± 14.4	15.0 ± 2.8	12.6 ± 10.4	10.6 ± 8.3	3.7 ± 0.3	6.7 ± 2.7	11.6 ± 4.9
<i>Water column</i>							
Ahe	66	14	7	30	24	11	12
Manihi	57	3	7	18	18	11	1
Takaroa	47	6	18	4	13	8	5
Total	170	23	32	52	55	30	18
Predominant polymer types (%)	PE (40.0%); PE-PP (14.1%); PP (11.2%); Others (34.7%)	Polyester (39.1%); PE (34.8%); Others (26.1%)	Polyester (68.7%); PE (25.0%); Others (6.2%)	PS (32.7%); PVC (25.0%); Polyisoprene (15.4%); Others (26.9%)	Polyisoprene (81.8%); Others (18.2%)	PE (50.0%); PE-PP (6.7%); PVC (13.3%); Others (30.0%)	-
Relative abundance (mean ± SD)	45.4 ± 4.7	5.7 ± 3.0	9.4 ± 7.4	12.6 ± 7.6	14.4 ± 1.4	8.1 ± 1.4	4.4 ± 3.3
<i>Pearl oyster</i>							
Ahe	63	10	6	4	4	8	0
Manihi	81	9	6	10	3	42	11
Takaroa	58	9	7	2	7	2	3
Total	202	28	19	16	14	52	14
Predominant polymer types (%)	PP (25.7%); EVA (19.8%); PE (13.4%); PE-PP (9.4%); Others (31.7%)	Polyester (35.7%); PS (17.9%); EVA (14.3%); Others (32.1%)	Polyester (42.1%); PE (15.8%); EVA (15.8%); Others (26.3%)	PA (50.0%); PE (18.7%); EVA (12.5%); Others (18.7%)	Polyester (57.1%); Polyisoprene (21.4%); Others (21.4%)	PVC (44.2%); PE (36.5%); PE-PP (7.7%); Others (11.5%)	-
Relative abundance (mean ± SD)	60.7 ± 9.3	8.8 ± 2.8	6.0 ± 2.1	4.2 ± 1.9	4.7 ± 3.1	12.2 ± 12.3	3.4 ± 3.4

Table S8. Particles identified by spectroscopy in water column samples (plankton net, 40 μm) according to study site and their relative abundance. A total of 991 particles was analysed based on a sub-sampling procedure (Kedzierski et al., 2019).

Polymer*	Ahe		Manihi		Takaroa	
	Identified particles (item)	Relative abundance (%)	Identified particles (item)	Relative abundance (%)	Identified particles (item)	Relative abundance (%)
<i>Plastic</i>						
Acrylic	4	1.3	0	0.0	0	0.0
EVA	0	0.0	0	0.0	0	0.0
PA	0	0.0	0	0.0	11	2.9
Polyester	16	5.1	10	3.7	18	4.7
PE	50	15.9	34	12.7	25	6.5
PE-PP	10	3.2	5	1.9	14	3.7
Polyisoprene	26	8.3	18	6.7	15	3.9
PP	7	2.2	5	1.9	9	2.4
PU	5	1.6	0	0.0	0	0.0
PS	19	6.0	5	1.9	2	0.5
PVC	4	1.3	17	6.4	0	0.0
Other plastics	16	5.1	22	8.2	11	2.9
<i>Non-plastic</i>						
Cotton	9	2.9	16	6.0	23	6.0
Lignin/Cellulose	27	8.6	0	0.0	9	2.4
Mineral compounds	6	1.9	21	7.9	60	15.7
Pigment	24	7.6	20	7.5	49	12.8
Protein	2	0.6	0	0.0	15	3.9
Stearate	6	1.9	19	7.1	3	0.8
Other non-plastics	33	10.5	29	10.9	51	13.4
<i>Non-identifiable</i>	51	16.2	46	17.2	67	17.5
Total	315	100.0	267	100.0	382	100.0

EVA: ethylene-vinyl acetate; PA: polyamide; Polyester (including polyethylene terephthalate, PET); PE: polyethylene; PP: polypropylene; PS: polystyrene (mostly styrene copolymer based), PU: polyurethane, PVC: polyvinyl chloride.

*Excluding the polymer rayon

Table S9. Relative abundance of synthetic polymers among certified microplastics in water column samples (plankton net, 40 μm).

Polymer*	Ahe		Manihi		Takaroa	
	Identified particles (item)	Relative abundance (%)	Identified particles (item)	Relative abundance (%)	Identified particles (item)	Relative abundance (%)
Acrylic	4	2.5	0	0.0	2	1.9
EVA	0	0.0	1	0.9	2	1.9
PA	0	0.0	3	2.8	11	10.7
Polyester	16	10.2	10	9.3	18	17.5
PE	50	31.8	34	31.5	25	24.3
PE-PP	10	6.4	5	4.6	14	13.6
Polyisoprene	26	16.6	18	16.7	15	14.6
PP	7	4.5	5	4.6	9	8.7
PU	19	12.1	5	4.6	2	1.9
PS	5	3.2	0	0.0	0	0.0
PVC	4	2.5	17	15.7	2	1.9
Other plastics	16	10.2	10	9.3	3	3.0
Total	157	100.0	108	100.0	103	100.0

EVA: ethylene-vinyl acetate; PA: polyamide; Polyester (including polyethylene terephthalate, PET); PE: polyethylene; PP: polypropylene; PS: polystyrene (mostly styrene copolymer based), PU: polyurethane, PVC: polyvinyl chloride.

*Excluding the polymer rayon

Table S10. Particles identified by spectroscopy in pearl oyster samples after digestion according to study site and their relative abundance. A total of 1,908 particles was analysed based on a sub-sampling procedure (Kedzierski et al., 2019).

Polymer*	Ahe		Manihi		Takaroa	
	Identified particles (item)	Relative abundance (%)	Identified particles (item)	Relative abundance (%)	Identified particles (item)	Relative abundance (%)
<i>Plastic</i>						
Acrylic	0	0.0	0	0.0	0	0.0
EVA	8	1.5	27	4.7	20	3.3
PA	0	0.0	11	1.9	0	0.0
Polyester	17	3.1	16	2.8	12	2.0
PE	8	1.5	38	6.7	15	2.5
PE-PP	9	1.6	9	1.6	10	1.7
Polyisoprene	0	0.0	0	0.0	0	0.0
PP	13	2.4	35	6.1	21	3.5
PU	0	0.0	0	0.0	0	0.0
PS	11	2.0	7	1.2	2	0.3
PVC	0	0.0	24	4.2	0	0.0
Other plastics	29	5.3	13	2.3	23	3.8
<i>Non-plastic</i>						
Cotton	105	19.2	54	9.5	61	10.2
Lignin/Cellulose	30	5.5	18	3.2	47	7.8
Mineral compounds	0	0.0	0	0.0	0	0.0
Pigment	15	2.7	65	11.4	36	6.0
Protein	17	3.1	41	7.2	39	6.5
Stearate	9	1.6	26	4.6	13	2.2
Other non-plastics	144	26.4	141	24.7	144	24.0
<i>Non-identifiable</i>	131	24.0	46	8.1	156	26.0
Total	546	100.0	571	100.0	599	100.0

EVA: ethylene-vinyl acetate; PA: polyamide; Polyester (including polyethylene terephthalate, PET); PE: polyethylene; PP: polypropylene; PS: polystyrene (mostly styrene copolymer based), PU: polyurethane, PVC: polyvinyl chloride.

*Excluding the polymer rayon

Table S11. Relative abundance of synthetic polymers among certified microplastics in pearl oyster samples.

Polymer*	Ahe		Manihi		Takaroa	
	Identified particles (item)	Relative abundance (%)	Identified particles (item)	Relative abundance (%)	Identified particles (item)	Relative abundance (%)
Acrylic	0	0.0	0	0.0	1	1.0
EVA	8	8.9	27	15.2	20	19.2
PA	3	3.3	11	6.2	4	3.8
Polyester	17	18.9	16	9.0	15	14.4
PE	8	8.9	38	21.3	15	14.4
PE-PP	9	10.0	9	5.1	10	9.6
Polyisoprene	1	1.1	0	0.0	3	2.9
PP	13	14.4	35	19.7	21	20.2
PU	11	12.2	7	3.9	2	1.9
PS	3	3.3	2	1.1	0	0.0
PVC	3	3.3	24	13.5	0	0.0
Other plastics	14	15.6	9	5.1	13	12.5
Total	90	100.0	178	100.0	104	100.0

EVA: ethylene-vinyl acetate; PA: polyamide; Polyester (including polyethylene terephthalate, PET); PE: polyethylene; PP: polypropylene; PS: polystyrene (mostly styrene copolymer based), PU: polyurethane, PVC: polyvinyl chloride.

*Excluding the polymer rayon

References

- Kedzierski. M., Villain. J., Falcou-Préfol. M., Kerros. M.E., Henry. M., Pedrotti. M.L., Bruzaud. S.. 2019. Microplastics in Mediterranean Sea: A protocol to robustly assess contamination characteristics. PLOS ONE 14. e0212088. <https://doi.org/10.1371/journal.pone.0212088>