

Supplementary materials for

**Passive and active removal of marine microplastics by a mushroom
coral (*Danafungia scruposa*)**

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Figures

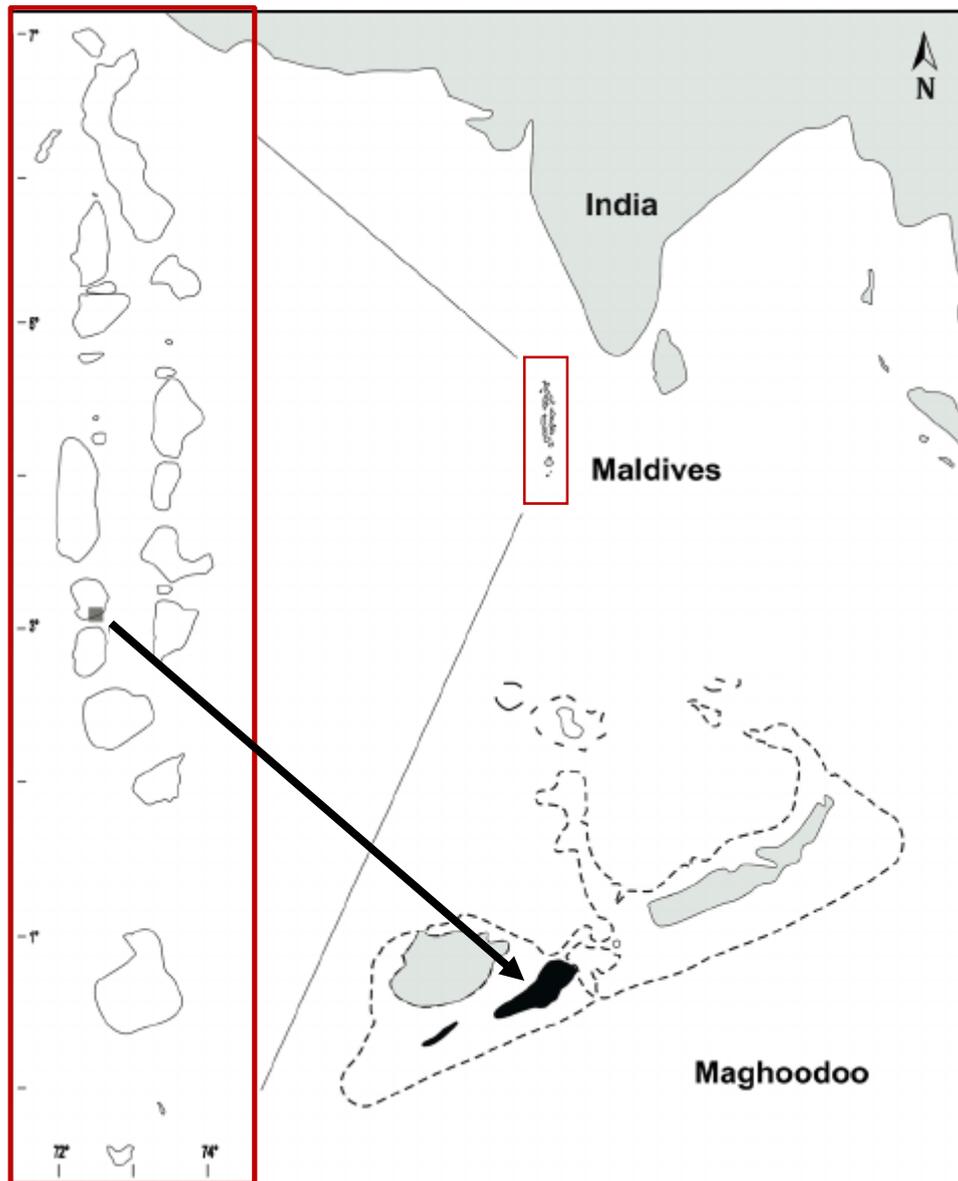


Figure S1: Sampling site. The inhabited island of Magoodhoo, Faafu Atoll, Republic of Maldives (N 3° 05' 24.3'' E 72° 58' 04.5'').

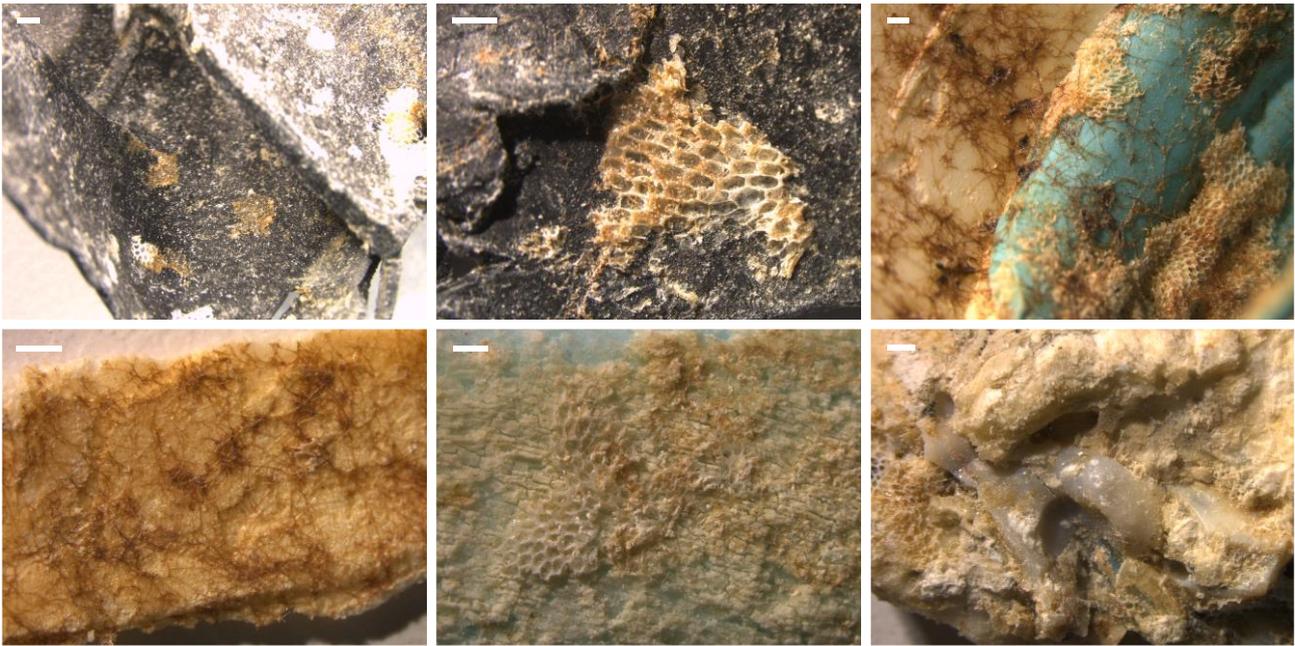


Figure S2 Stereomicroscope imaging of plastic collected from the marine environment. Bars represent a 1 mm scale.

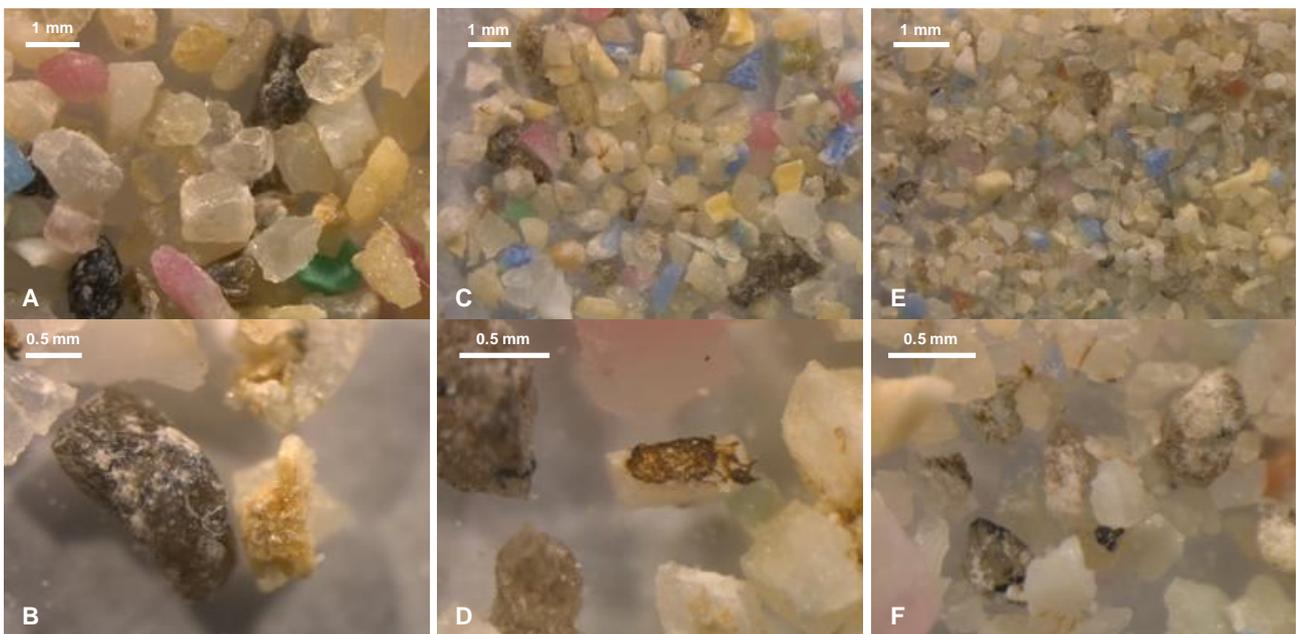


Figure S3 Stereomicroscope imaging of microplastics obtained from fragmentation of plastics collected from the marine environment. Imaging of microplastics from three size classes: 800-1000 μm (A, B), 500 – 800 μm (C, D) and 200 – 500 μm (E, F).

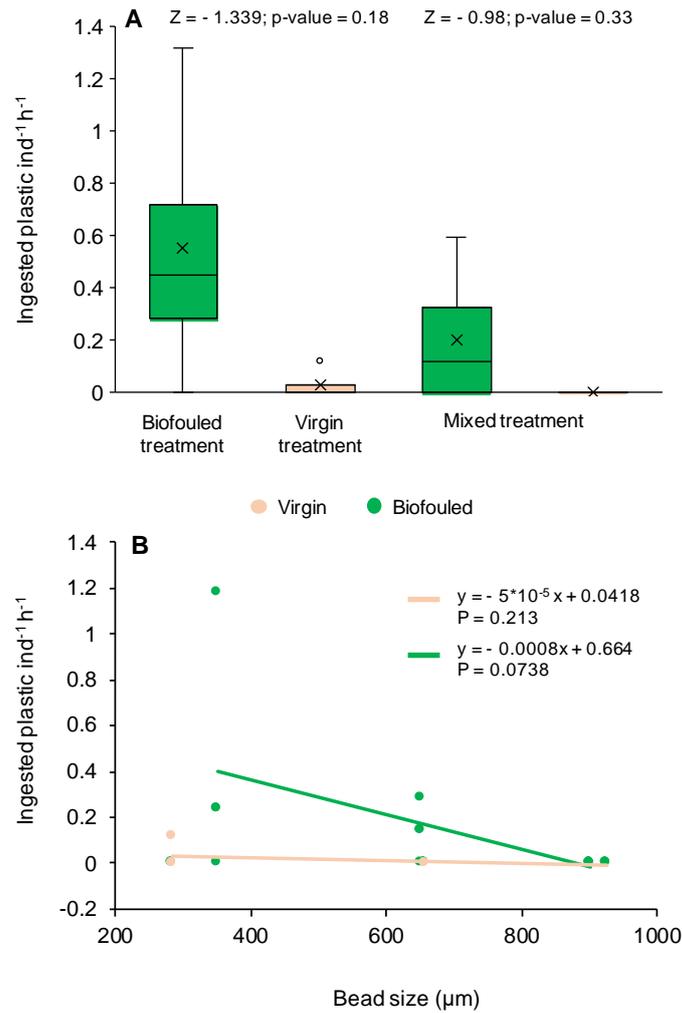


Figure S4 Plastic removal by ingestion and distribution of ingested plastic in size classes (corrected values). **A)** Ingested plastic (number of microplastics individual⁻¹ hour⁻¹, corrected values following recovery test) in corals exposed to three treatments: corals treated with biofouled plastic only (“Biofouled”, in green, N=4), with virgin plastic only (“Virgin”, in pink, N=4) and biofouled plastic (in green) and virgin plastic (in pink) mixed (“Mixed”, N=6). All estimates have been compared with Wilcoxon tests for which the p-value and Z value are reported in the figures. **B)** Distribution of ingested plastic (N microplastics individual⁻¹ hour⁻¹, corrected values following recovery test) in size classes in the Virgin treatment (pink) and in the Biofouled treatment (green). Size classes are reported as the mean value of the size class bin. Lines represent the linear fit of each set of data of the corresponding colour. Equations and p-values of each linear model are reported in figure.

Tables

Table S1 Size classes, mass and number of plastics used for the Plastic and Plastic + *Artemia salina* treatments (first experiment). The first column reports the 3 size classes of plastic to which each of 14 corals were exposed in the first experiment, while the second and third column reports the weight and number of plastic used for each size class.

Plastic (x7) and Plastic + <i>Artemia salina</i> (x7) treatments		
Size class (μm)	Weight (g)	N
212-355	0.012 ± 0.00005	997 ± 5
600-710	0.147 ± 0.00003	1000 ± 0.2
850-1000	0.414 ± 0.00006	1000 ± 0.1

Table S2 Size classes, mass and number of plastics used for the Virgin, Biofouled and Mixed treatments (second experiment). The column “Size class” reports the 3 size classes of plastic to which each of 4 corals were exposed in the Virgin treatment, each of 4 corals in the Biofouled treatment and each of 6 corals in the Mixed treatment. The second and third column reports the mean weight and number (\pm SE) of plastic used for each size class and treatment.

Virgin treatment			Biofouled treatment		
Size class (μ m)	Weight (g)	Number	Size class (μ m)	Weight (g)	Number
212-355	0.012 \pm 0.0001	997 \pm 6	200-500	0.023 \pm 0.0001	927 \pm 16
600-710	0.147 \pm 0.0002	1000 \pm 0.6	500-800	0.144 \pm 0.0001	1040 \pm 40
800-1000	0.414 \pm 0.0002	1000 \pm 0.2	800-1000	0.382 \pm 0.0001	1039 \pm 16
Mixed treatment					
Size class (μ m)	Weight (g)	N	Size class (μ m)	Weight (g)	N
212-355	0.006 \pm 0.00007	480 \pm 11	200-500	0.011 \pm 0.00003	467 \pm 7
600-710	0.073 \pm 0.00004	500 \pm 0.2	500-800	0.072 \pm 0.00005	520 \pm 16
800-1000	0.207 \pm 0.00003	500 \pm 0.1	800-1000	0.191 \pm 0.00005	519 \pm 6

Table S3. Yields (ng/g and ng/ μ L) and quality (A260/280 and A260/230) of total DNA extracted from 0.25 ± 0.01 g of three classes of microplastic obtained from natural plastic fragments (Figure S2).

Total DNA	Particle size (μ m)		
	200-500	500-800	800-1000
Number of plastic fragments in 0.25 g	10300 \pm 438	1727 \pm 124	650 \pm 40
ng/g	134.9 \pm 11.4	73 \pm 8.3	48.4 \pm 1.4
ng/ μ L	0.31 \pm 0.05	0.18 \pm 0.01	0.12 \pm 0.01
A260/280	1.49 \pm 0.03	1.54 \pm 0.08	1.51 \pm 0.08
A260/230	0.45 \pm 0.04	0.41 \pm 0.02	0.41 \pm 0.04

Table S4 Descriptive statistics of ingested plastic in the two experiments. Mean, Median, first and third quartile values (Q_1 and Q_3) and interquartile range ($IQR = Q_3 - Q_1$) of number of plastic pieces ingested individual⁻¹ h⁻¹ in each treatment of the two experiments and for each plastic type of the Mixed treatment of the second experiment.

First experiment					
	Mean	Median	Q_1	Q_3	IQR
Plastic + <i>Artemia</i>	0.107	0.125	0	0.188	0.188
Plastic	0.125	0	0	0.188	0.188
Second experiment					
	Mean	Median	Q_1	Q_3	IQR
Biofouled treatment:					
- Uncorrected values	0.344	0.313	0.188	0.469	0.281
- Corrected values	0.553	0.449	0.283	0.719	0.436
Virgin treatment	0.031	0	0	0.031	0.031
Mixed treatment - biofouled plastic:					
- Uncorrected values	0.125	0.063	0	0.218	0.219
- Corrected values	0.198	0.117	0	0.328	0.328
Mixed treatment - virgin plastic	0	0	0	0	0

Table S5 Result of ANCOVA tests. Results of the ANCOVA tests between the Plastic and Plastic + *Artemia salina* treatments and between the Biofouled and Virgin treatments for both ingested and adhered plastic. For each ANCOVA test, we report the independent variable tested (Term), the estimates of the intercept and of the slopes (Est.), the standard error, T and the p-values of the model.

Comparison (ANCOVA test) between Plastic and Plastic + <i>Artemia salina</i> treatments				
INGESTION				
Term	Est.	Std.error	T	Prob> t
Intercept	0.1451944	0.031216	4.65	<0.0001*
Treatment	-0.002976	0.012271	-0.24	0.8097
size	-0.000172	4.632e-5	-3.71	0.0007*
Treatment*size	-1.498e-6	4.632e-5	-0.03	0.9744
ADHESION				
Term	Est.	Std.error	T	Prob> t
Intercept	2.3234777	0.492276	4.72	<0.0001*
Treatment	0.077381	0.193508	0.40	0.6915
size	-0.001146	0.00073	-1.57	0.1248
Treatment*size	-6.443e-5	0.00073	-0.09	0.9302
Comparison (ANCOVA test) between Virgin and Biofouled treatments				
INGESTION				
Term	Est.	Std.error	T	Prob> t
Intercept	0.2110343	0.080504	2.62	0.0185*
Treatment	0.0546895	0.03007	1.82	0.0877
size	-0.000233	0.000123	-1.89	0.0767
Treatment*size	-0.000162	0.000123	-1.31	0.2087
ADHESION				
Term	Est.	Std.error	T	Prob> t
Intercept	2.4527063	1.53787	1.59	0.1264
Treatment	-0.0013965	0.002286	0.61	0.5481
size	-0.499126	0.554326	-0.90	0.3786
Treatment*size	-0.003735	0.002286	-1.63	0.1179

Supplementary Data 1 (external file). Abundance of plastic found ingested, adhered to the coral surface and left in the bag at the end of two experiments for each coral replicate and size class of plastic.