Supporting Information

Microplastics retention in secondary sewage sludge: characterization and influence of solid concentration

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Table S1. MPs present in the sludge used in Jar test experiments (beakers filled with 500 mL of distilled water)

Month (2023)	g Sludge (wet weight added to beaker)	Experiment in Jar Test	Number of native MPs in sludge	Number of supplemented MPs	Total initial number of MPs	Initial MP concentration (MPs/L)
June	10	with coagulant	3	174	177	433
July	10	with flocculant	4	164	168	474
August	1	without any chemical agent	1	220	221	549
	25		12	220	232	549
September	10		5	133	138	549
	100		53	133	186	
October	50		24	120	144	587
November	5		2	200	202	587

Figure S1. Comparison of the abundance of native MPs in thickened secondary sludges: shape (a), size (b) (samples before the treatments).

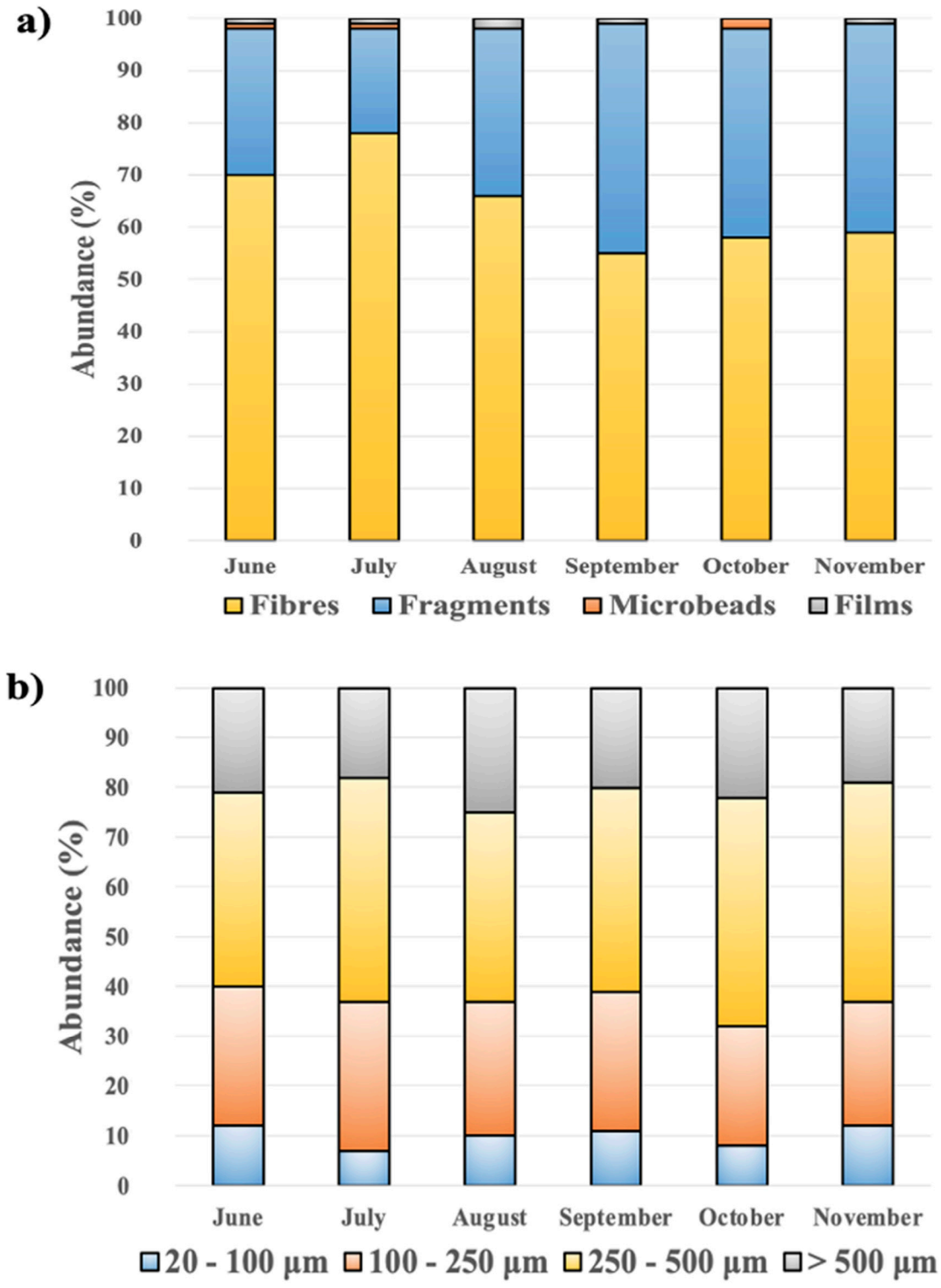


Figure S2. % Chemical composition of MPs analysed in secondary sewage sludges

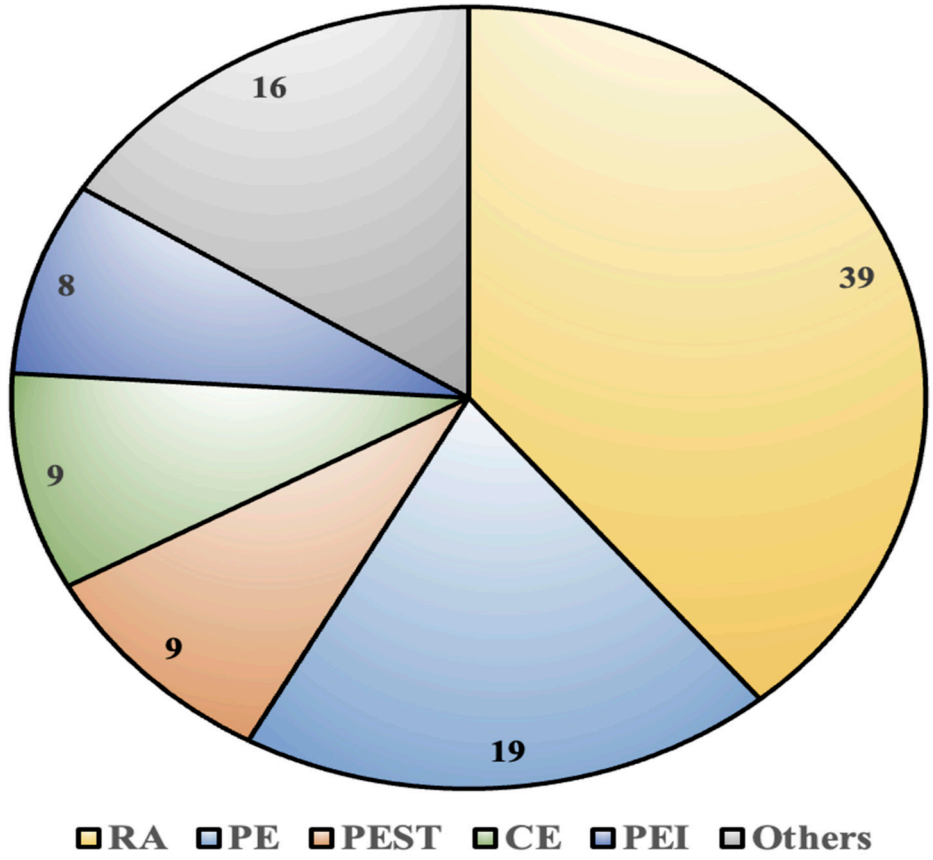


Figure S3. μFTIR spectra of all 14 MP types analyzed in this study

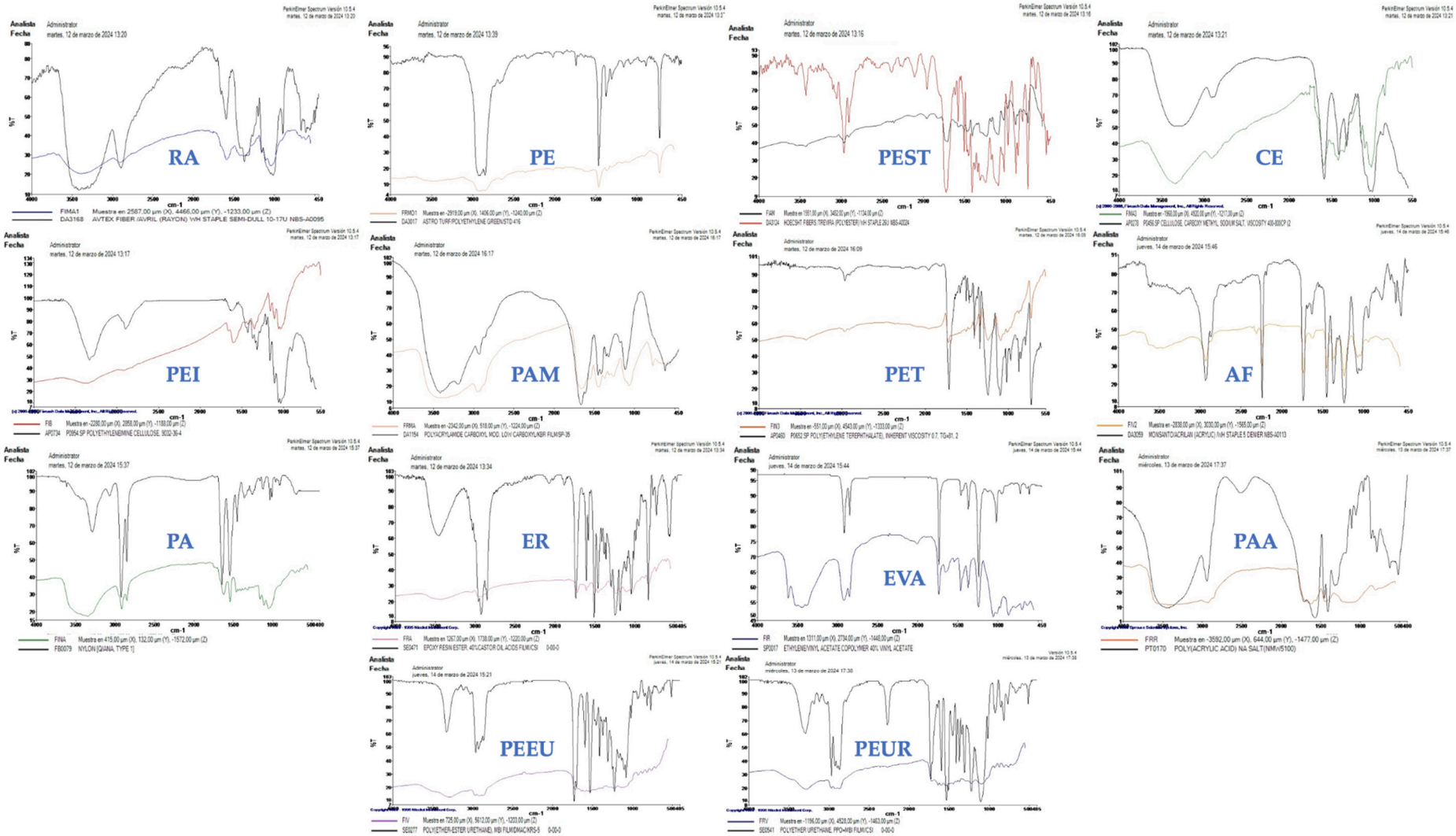


Table S2. Main characteristics of MPs recovered in the supernatant samples

Month (2023)	Sludge sample weight (g)	Experiment in Jar Test	N. MPs recovered	% Abundance MP Size				% Abundance MP Shape			
				20 - 100 µm	100 - 250 µm	250 - 500 µm	> 500 µm	Fibres	Fragments	Films	Microbeads
June	10	with coagulant	33	6	12	50	32	71	19	-	10
July	10	with flocculant	51	6	13	52	29	77	22	-	1
August	1	without any chemical agent	193	4	33	39	24	57	40	2	1
	25		89	6	33	42	19	59	37	2	2
September	10		99	8	28	44	20	59	40	1	-
	100		71	6	35	43	16	60	39	1	-
October	50		54	5	31	50	14	59	35	2	4
November	5		158	8	35	41	16	59	40	1	-

Table S3. Comparing MPs in settled sludges according to their sizes and shapes

10 g of settled sludge without chemical agents					**10 g of settled sludge with $FeCl_3$**					**10 g of settled sludge with non-ionic PAM**				
MP size (µm)	**Nº Fibres**	**Nº Fragments**	**Nº Films**	**Nº Microbeads**	**MP size (µm)**	**Nº Fibres**	**Nº Fragments**	**Nº Films**	**Nº Microbeads**	**MP size (µm)**	**Nº Fibres**	**Nº Fragments**	**Nº Films**	**Nº Microbeads**
> 500	13	10	0	0	***> 500***	54	17	1	3	***> 500***	36	10	1	1
250 – 500	5	3	0	1	***250 – 500***	33	13	1	5	***250 – 500***	26	7	0	1
100 - 250	4	2	0	0	***100 - 250***	12	9	1	2	***100 - 250***	21	5	0	0
20 - 100	3	0	0	0	***20 - 100***	5	3	0	0	***20 - 100***	9	3	0	0
TOTAL N° MPs	**25**	**17**	**0**	**1**	**TOTAL N° MPs**	**104**	**42**	**3**	**10**	**TOTAL N° MPs**	**92**	**25**	**1**	**2**
% MPs TOTAL	**60**	**36**	**0**	**2**	**% MPs TOTAL**	**69**	**28**	**2**	**7**	**% MPs TOTAL**	**77**	**21**	**1**	**2**