Supplementary material

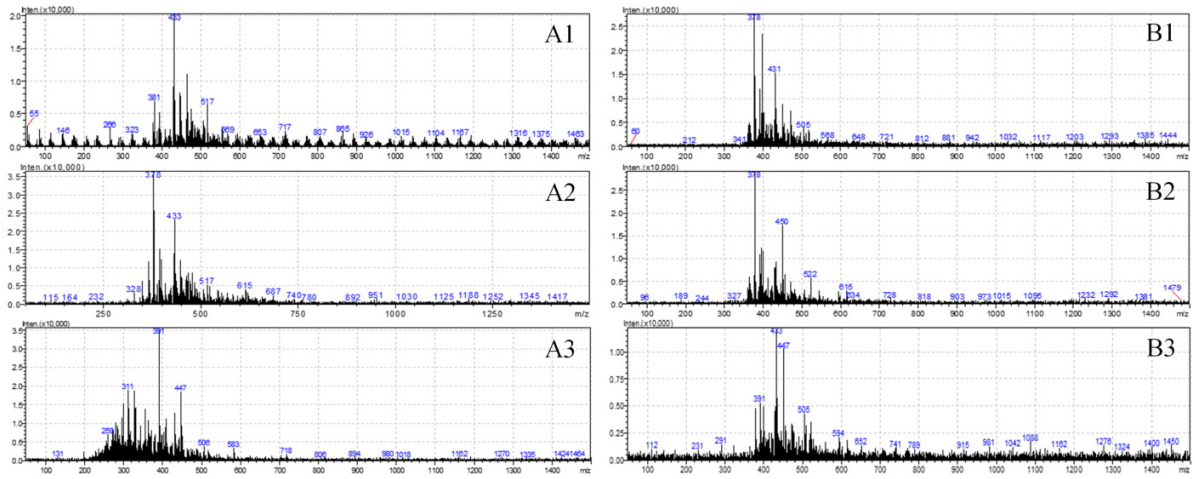

Figure S1. The MS spectra of the aqueous phase in contact with MPs for biodegradation experiments with *Delftia acidovorans* (A) and *Candida parapsilosis* (B). The following cases are shown: the aqueous phase at the beginning of the biodegradation experiments (A1 and B1), the aqueous phase after 30 days of exposure to PS (A2 and B2), and the aqueous phase after 30 days of exposure to PVC (A3 and B3).

Table S1. Experimental design to determine the optimal conditions for the biodegradation of PS and PVC MPs by bacterium and yeast selected as the best in preliminary experiments. The design included the pH value of the medium, agitation speed (*AS*), and cell density (*OD*).

Selected bacterium				Selected yeast			
Exp. no.	pH	*AS* / rpm	*OD*	Exp. no.	pH	*AS* / rpm	*OD*
1-1	6	120	1.0	2-1	3	120	1.0
1-2	6	120	0.5	2-2	3	120	0.5
1-3	6	120	0.1	2-3	3	120	0.1
1-4	7	120	1.0	2-4	5	120	1.0
1-5	7	120	0.5	2-5	5	120	0.5
1-6	7	120	0.1	2-6	5	120	0.1
1-7	8	120	1.0	2-7	7	120	1.0
1-8	8	120	0.5	2-8	7	120	0.5
1-9	8	120	0.1	2-9	7	120	0.1
1-10	6	160	1.0	2-10	3	160	1.0
1-11	6	160	0.5	2-11	3	160	0.5
1-12	6	160	0.1	2-12	3	160	0.1
1-13	7	160	1.0	2-13	5	160	1.0
1-14	7	160	0.5	2-14	5	160	0.5
1-15	7	160	0.1	2-15	5	160	0.1
1-16	8	160	1.0	2-16	7	160	1.0
1-17	8	160	0.5	2-17	7	160	0.5
1-18	8	160	0.1	2-18	7	160	0.1
1-19	6	200	1.0	2-19	3	200	1.0
1-20	6	200	0.5	2-20	3	200	0.5
1-21	6	200	0.1	2-21	3	200	0.1
1-22	7	200	1.0	2-22	5	200	1.0
1-23	7	200	0.5	2-23	5	200	0.5
1-24	7	200	0.1	2-24	5	200	0.1
1-25	8	200	1.0	2-25	7	200	1.0
1-26	8	200	0.5	2-26	7	200	0.5
1-27	8	200	0.1	2-27	7	200	0.1

Table S2. The suitability of four regression models (Eqs. (1)–(4)) to fit the experimental data of log CFU for the biodegradation of PS and PVC MPs by *Delftia acidovorans* and *Candida parapsilosis*. The influence of three factors: medium pH, agitation speed (*AS*) and cell density (*OD*) was considered.

Microorganism	MP	Model	Equation	R^2	R^2_{adj}	F	p^*
Delftia acidovorans	PS	I	$\log CFU = 7.67 + 6.11\cdot10^{-3}\cdot pH - 3.11\cdot10^{-3}\cdot AS + 5.37\cdot10^{-1}\cdot OD$	0.5983	0.5459	11.42	< 0.0001
		II	$\log CFU = 2.71 + 7.42\cdot10^{-1}\cdot pH + 3.21\cdot10^{-2}\cdot AS - 1.11\cdot OD - 5.21\cdot10^{-3}\cdot pH\cdot AS + 1.83\cdot10^{-1}\cdot pH\cdot OD + 2.32\cdot10^{-3}\cdot AS\cdot OD$	0.8777	0.8410	23.92	< 0.0001
		III	$\log CFU = 10.78 - 8.11\cdot10^{-1}\cdot pH - 7.78\cdot10^{-3}\cdot AS + 9.49\cdot10^{-1}\cdot OD + 5.83\cdot10^{-2}\cdot pH^2 + 1.46\cdot10^{-5}\cdot AS^2 - 3.69\cdot10^{-1}\cdot OD^2$	0.6235	0.5106	5.52	0.0016
		IV	$\log CFU = 5.83 - 7.48\cdot10^{-2}\cdot pH + 2.74\cdot10^{-2}\cdot AS - 7.03\cdot10^{-1}\cdot OD - 5.21\cdot10^{-3}\cdot pH\ AS + 1.83\cdot10^{-1}\cdot pH\ OD + 2.32\cdot10^{-3}\cdot AS\cdot OD + 5.83\cdot10^{-2}\cdot pH^2 + 1.46\cdot10^{-5}\cdot AS^2 - 3.69\cdot10^{-1}\cdot OD^2$	0.9029	0.8514	17.56	< 0.0001
	PVC	I	$\log CFU = 8.39 - 3.86\cdot10^{-2}\cdot pH - 1.57\cdot AS + 3.15\cdot10^{-1}\cdot OD$	0.6923	0.6522	17.25	< 0.0001
		II	$\log CFU = 7.61 + 2.39\cdot10^{-2}\cdot pH + 5.41\cdot AS + 3.45\cdot10^{-1}\cdot OD - 6.87\cdot pH\cdot AS + 8.89\cdot10^{-2}\cdot pH\cdot OD - 4.08\cdot AS\cdot OD$	0.8320	0.7816	16.50	< 0.0001
		III	$\log CFU = 7.90 + 4.32\cdot10^{-1}\cdot pH - 1.68\cdot10^{-2}\cdot AS + 5.43\cdot10^{-1}\cdot OD - 3.36\cdot10^{-2}\cdot pH^2 + 4.75\cdot AS^2 - 2.04\cdot10^{-1}\cdot OD^2$	0.7694	0.7002	11.12	< 0.0001
		IV	$\log CFU = 7.12+ 4.95\cdot10^{-1}\cdot pH - 9.80\cdot AS + 5.73\cdot10^{-1}\cdot OD - 6.87\cdot pH\cdot AS + 8.89\cdot10^{-2}\cdot pH\cdot OD - 4.08\cdot AS\cdot OD - 3.36\cdot10^{-2}\cdot pH^2 + 4.75\cdot AS^2 - 2.04\cdot10^{-1}\cdot OD^2$	0.9090	0.8609	18.88	< 0.0001
Candida parapsilosis	PS	I	$\log CFU = 5.63 + 1.96\cdot10^{-1}\cdot pH - 2.45\cdot AS + 2.30\cdot10^{-1}\cdot OD$	0.6959	0.6562	17.54	< 0.0001
		II	$\log CFU = 5.60 + 2.37\cdot10^{-1}\cdot pH - 3.37\cdot AS - 1.49\cdot10^{-2}\cdot OD - 2.03\cdot pH\cdot AS - 1.74\cdot10^{-2}\cdot pH\cdot OD + 2.08\cdot AS\cdot OD$	0.7013	0.6117	7.83	0.0002
		III	$\log CFU = 1.59 + 1.22\cdot pH + 2.30\cdot10^{-2}\cdot AS - 1.72\cdot10^{-2}\cdot OD - 1.03\cdot10^{-1}\cdot pH^2 - 7.25\cdot AS^2 + 2.22\cdot10^{-1}\cdot OD^2$	0.9568	0.9438	73.76	< 0.0001
		IV	$\log CFU = 1.56 + 1.27\cdot pH + 2.29\cdot10^{-2}\cdot AS - 2.63\cdot10^{-1}\cdot OD - 2.03\cdot pH\cdot AS - 1.74\cdot10^{-2}\cdot pH\cdot OD + 2.08\cdot AS\cdot OD - 1.03\cdot10^{-1}\cdot pH^2 - 7.25\cdot AS^2 + 2.22\cdot10^{-1}\cdot OD^2$	0.9622	0.9422	48.05	< 0.0001
	PVC	I	$\log CFU = 6.95 - 5.28\ pH - 2.69\ AS + 1.09\ OD$	0.8602	0.8420	47.19	< 0.0001
		II	$\log CFU = 6.65 + 1.36\cdot10^{-2}\cdot pH - 1.30\cdot AS + 1.63\cdot OD - 2.08\cdot pH\cdot AS - 2.92\cdot10^{-2}\cdot pH\cdot OD - 2.41\cdot AS\cdot OD$	0.8661	0.8259	21.55	< 0.0001
		III	$\log CFU = 4.44 + 4.41\cdot10^{-1}\cdot pH + 1.53\cdot10^{-2}\cdot AS + 1.94\cdot OD - 4.46\cdot10^{-2}\cdot pH^2 - 5.63\cdot AS^2 - 7.60\cdot10^{-1}\cdot OD^2$	0.9310	0.9103	44.96	< 0.0001
		IV	$\log CFU = 4.14 + 4.59\cdot10^{-1}\cdot pH + 1.67\cdot10^{-2}\cdot AS + 2.47\cdot OD - 2.08\cdot pH\cdot AS - 2.92\cdot10^{-2}\cdot pH\cdot OD - 2.41\cdot AS\cdot OD - 4.46\cdot10^{-2}\cdot pH^2 - 5.63\cdot AS^2 - 7.60\cdot10^{-1}\cdot OD^2$	0.9368	0.9034	28.00	< 0.0001

* $p < 0.05$ (significance)