

Table S1. Water quality analysis of samples collected from the Miyun Reservoir.

Samples	T °C	DO mg/L	TDS mg/L	NO ₂ -N mg/L	NO ₃ -N mg/L	NH ₄ ⁺ -N mg/L	TN mg/L	TP mg/L
BHB_B_APR	11.8	8.72	209	0.0034	0.53	0.0006	3.7	0.151
BHB_B_AUG	23.9	7.7	249	0.0012	1	0.474	2	0.03
BHB_B_JUN	17.1	8.2	239	0.0107	0.499	0.0002	2.8	0.05
BHB_B_OCT	13.9	9.16	221	0.0026	0.21	0.0017	3.8	0.28
BHB_D_APR	11	8.19	209	0.0028	0.1	0.0014	4.1	0.104
BHB_D_AUG	18.1	6.12	286	0.0016	0.1	0.0056	2	0.02
BHB_D_JUN	15.4	6.3	248	0.0085	0.539	0.0002	3.5	0.04
BHB_D_OCT	10.8	7.9	238	0.0025	0.039	0.0009	2	0.11
BHB_Z_APR	11.4	8.7	208	0.003	0.72	0.0008	2.9	0.119
BHB_Z_AUG	23.8	7.09	250	0.0008	1.58	0.612	2	0.05
BHB_Z_JUN	16.8	7.5	238	0.01	0.248	0.0004	2.9	0.03
BHB_Z_OCT	11.7	8.24	231	0.0042	0.14	0.0014	1.6	0.18
BHK_APR	10.3	8.23	217	0.0035	0.68	0.0005	3.6	0.165
BHK_AUG	23.6	8.8	238	0.0008	0.1	0.0248	3.8	0.06
BHK_JUN	15.1	8.2	247	0.0096	0.519	0.0001	3.5	0.09
BHK_OCT	12.9	10.18	235	0.0023	0.514	0.0012	2.8	0.15
CHB_B_APR	12	9.34	232	0.0017	1.92	0.0003	3	0.134
CHB_B_AUG	24.7	8.66	219	0.0015	0.1	0.0025	0.7	0.02
CHB_B_JUN	17.1	8.2	263	0.0031	0.117	0.0009	2.6	0.07
CHB_B_OCT	14.3	8.71	251	0.0087	0.434	0.0005	2.3	0.04
CHB_D_APR	10.9	8.35	232	0.0023	2.28	0.0003	3.9	0.14
CHB_D_AUG	14.1	2.76	252	0.0015	1.07	0.0001	2.2	0.02
CHB_D_JUN	16	6.9	265	0.012	0.52	0.0001	2.6	0.27
CHB_D_OCT	11.2	8.35	256	0.0061	0.039	0.0004	2	0.12
CHB_Z_APR	11.2	8.71	231	0.0024	1.21	0.0004	3.1	0.137
CHB_Z_AUG	15.6	6.75	264	0.0016	0.34	0.0046	2	0.01
CHB_Z_JUN	16.3	7.4	266	0.0032	0.467	0.0006	2.9	0.04
CHB_Z_OCT	12.9	8.37	254	0.0033	0.04	0.0001	2.8	0.34
CHK_APR	10.2	9.12	228	0.0017	4.41	0.0009	5.5	0.154
CHK_AUG	23.2	8.81	255	0.001	1.61	0.0057	1.8	0.03
CHK_JUN	15.8	7.8	270	0.0093	0.229	0.0007	2.7	0.16
CHK_OCT	8.5	9	262	0.0104	0.785	0.0001	2.5	0.14
JG_APR	10.9	8.79	229	0.0028	0.92	0.0015	4.4	0.091
JG_AUG	24.2	8.16	245	0.0014	0.1	0.003	2	0.02
JG_JUN	16.5	8.3	257	0.0133	0.571	0.0008	2.2	0.05
JG_OCT	13.6	8.32	228	0.0021	0.017	0.0091	1.2	0.67
KZX_B_APR	11.4	8.66	230	0.0032	0.49	0.0005	4.5	0.172
KZX_B_AUG	23.8	7.63	251	0.0011	1.18	0.417	4.1	0.01
KZX_B_JUN	16.3	10	266	0.0115	0.193	0.0001	5.2	0.09
KZX_B_OCT	14.2	8.05	254	0.0015	0.041	0.0008	2.3	0.21
KZX_D_APR	10.7	8	230	0.0049	0.67	0.0003	5.1	0.25
KZX_D_AUG	21.9	5.79	245	0.001	1.74	0.709	1.9	0.02
KZX_D_JUN	16.4	7.8	266	0.0034	0.085	0.0004	3	0.05
KZX_D_OCT	11.7	7.1	257	0.004	0.046	0.0006	2	0.05
KZX_Z_APR	10.6	8.29	231	0.003	0.89	0.0003	3.8	0.23
KZX_Z_AUG	22.9	6.19	252	0.0009	0.97	0.0221	3.1	0.02
KZX_Z_JUN	16.7	8.9	265	0.0033	0.084	0.0005	3.1	0.1

KZX_Z_OCT	12.4	7.21	257	0.0039	0.156	0.0007	2.1	0.21
YL_APR	10.5	8.9	201	0.0023	0.85	0.0005	6.2	0.138
YL_AUG	24.8	8.33	238	0.0016	0.1	0.0404	4.2	0.03
YL_JUN	16.3	8.5	247	0.0028	0.052	0.0004	2.9	0.07
YL_OCT	12.9	9.13	219	0.01	0.384	0.0002	2.1	0.06

Table S2. Richness and diversity indices used in this study.

Sample	Raw reads	Filtered reads	OTUs	Ace	Chao	Shanno n	Coverag e
BHB_B_APR	32432.00	31546 (19380)*	681 (586)	849 (756)	830 (759)	3.94 (3.93)	0.9945 (0.9914)
BHB_B_AUG	39376.00	38325.00 (19380)	780.00 (616)	1025.0 (823)	1025.00 (821)	4.22 (4.2)	0.9941 (0.9905)
BHB_B_JUN	21535.00	21039.00 (19380)	607.00 (591)	770.00 (756)	820.00 (818)	4.37 (4.37)	0.9920 (0.9914)
BHB_B_OCT	39725.00	38561.00 (19380)	690.00 (571)	829.00 (679)	868.00 (689)	4.14 (4.11)	0.9960 (0.9932)
BHB_D_APR	20935.00	20225.00 (19380)	614.00 (605)	809.00 (792)	832.00 (824)	4.09 (4.08)	0.9908 (0.9906)
BHB_D_AUG	26433.00	25578.00 (19380)	680.00 (625)	896.00 (970)	864.00 (837)	4.07 (4.06)	0.9924 (0.9899)
BHB_D_JUN	22003.00	21484.00 (19380)	656.00 (629)	843.00 (819)	862.00 (857)	4.60 (4.59)	0.9915 (0.9906)
BHB_D_OCT	21753.00	20951.00 (19380)	662.00 (650)	842.00 (823)	897.00 (881)	4.42 (4.42)	0.9913 (0.9908)
BHB_Z_APR	28819.00	27245.00 (19380)	706.00 (634)	913.00 (826)	949.00 (826)	4.65 (4.63)	0.9929 (0.9908)
BHB_Z_AUG	33019.00	31742.00 (19380)	785.00 (663)	1027.00 (1099)	995.00 (924)	4.32 (4.3)	0.9928 (0.9886)
BHB_Z_JUN	37334.00	36546.00 (19380)	680.00 (581)	822.00 (709)	860.00 (713)	4.58 (4.56)	0.9957 (0.9926)
BHB_Z_OCT	36582.00	35453.00 (19380)	708.00 (600)	867.00 (718)	883.00 (734)	4.20 (4.2)	0.9953 (0.9926)
BHK_APR	20100.00	19380.00 (19380)	571.00 (571)	787.00 (787)	825.00 (825)	4.28 (4.28)	0.9905 (0.9905)
BHK_AUG	33358.00	24122.00 (19380)	969.00 (922)	1099.00 (1073)	1129.00 (1103)	5.40 (5.4)	0.9921 (0.9896)
BHK_JUN	38421.00	34907.00 (19380)	879.00 (738)	1118.00 (945)	1132.00 (945)	5.08 (5.07)	0.9934 (0.9895)
BHK_OCT	29240.00	28122.00 (19380)	608.00 (555)	722.00 (689)	753.00 (690)	4.24 (4.22)	0.9951 (0.9926)
CHB_B_APR	23750.00	22990.00 (19380)	677.00 (646)	880.00 (834)	908.00 (825)	4.60 (4.59)	0.9916 (0.9906)
CHB_B_AUG	33760.00	32735.00 (19380)	811.00 (725)	941.00 (913)	937.00 (916)	4.95 (4.94)	0.9950 (0.9900)
CHB_B_JUN	27579.00	26777.00 (19380)	762.00 (686)	979.00 (886)	951.00 (899)	4.98 (4.97)	0.9926 (0.9901)
CHB_B_OCT	37334.00	36355.00 (19380)	723.00 (626)	864.00 (797)	865.00 (829)	4.11 (4.1)	0.9955 (0.9910)
CHB_D_APR	38489.00	37485.00	802.00	1013.00	1003.00	4.72	0.9946

		(19380)	(673)	(859)	(903)	(4.7)	(0.9901)
CHB_D_AU	28227.00	27419.00	775.00	960.00	974.00	4.97	0.9929
G		(19380)	(698)	(894)	(925)	(4.95)	(0.9901)
CHB_D_JUN	27916.00	27160.00	754.00	934.00	935.00	4.97	0.9932
		(19380)	(699)	(899)	(866)	4.97	(0.9904)
CHB_D_OC	35791.00	34792.00	728.00	921.00	926.00	4.48	0.9946
T		(19380)	(625)	(814)	(839)	(4.47)	(0.9906)
CHB_Z_APR	25115.00	24517.00	684.00	853.00	836.00	4.34	0.9929
		(19380)	(643)	(810)	(803)	(4.33)	(0.9911)
CHB_Z_AU	23382.00	22511.00	798.00	1045.00	1092.00	4.78	0.9897
G		(19380)	(764)	(1008)	(993)	(4.78)	(0.9884)
CHB_Z_JUN	33938.00	33057.00	770.00	939.00	933.00	4.68	0.9945
		(19380)	(671)	(843)	(856)	(4.68)	(0.9909)
CHB_Z_OCT	34058.00	33143.00	741.00	897.00	901.00	4.50	0.9948
		(19380)	(653)	(838)	(838)	(4.49)	(0.9906)
CHK_APR	29857.00	28196.00	890.00	1172.00	1191.00	4.81	0.9905
		(19380)	(799)	(1301)	(1160)	(4.81)	(0.9857)
CHK_AUG	34896.00	31027.00	950.00	1155.00	1146.00	5.24	0.9927
		(19380)	(845)	(1111)	(1071)	(5.22)	(0.9874)
CHK_JUN	30297.00	28671.00	938.00	1168.00	1185.00	5.18	0.9914
		(19380)	(850)	(1091)	(1093)	(5.18)	(0.9876)
CHK_OCT	28803.00	27856.00	689.00	856.00	864.00	4.03	0.9936
		(19380)	(630)	(811)	(820)	(4.03)	(0.9908)
JG_APR	31690.00	29199.00	878.00	1132.00	1125.00	4.75	0.9912
		(19380)	(778)	(1074)	(1046)	(4.76)	(0.9869)
JG_AUG	25952.00	22906.00	901.00	1181.00	1156.00	5.22	0.9887
		(19380)	(859)	(1141)	(1133)	(5.21)	(0.9868)
JG_JUN	32671.00	30286.00	872.00	1098.00	1123.00	5.08	0.9925
		(19380)	(770)	(887)	(979)	(5.06)	(0.9889)
JG_OCT	36812.00	35355.00	769.00	984.00	995.00	4.22	0.9940
		(19380)	(655)	(870)	(920)	(4.21)	(0.9894)
KZX_B_APR	33612.00	32407.00	853.00	1104.00	1111.00	4.59	0.9925
		(19380)	(734)	(1008)	(977)	(4.58)	(0.9879)
KZX_B_AUG	28717.00	27785.00	825.00	1044.00	1042.00	4.97	0.9920
		(19380)	(749)	(1005)	(994)	(4.97)	(0.9884)
KZX_B_JUN	34433.00	33359.00	881.00	1086.00	1066.00	4.63	0.9936
		(19380)	(772)	(1022)	(1049)	(4.61)	(0.9881)
KZX_B_OCT	21576.00	20847.00	622.00	809.00	813.00	3.48	0.9911
		(19380)	(604)	(788)	(796)	(3.48)	(0.9907)
KZX_D_APR	27969.00	27089.00	780.00	999.00	1003.00	4.55	0.9919
		(19380)	(715)	(964)	(923)	(4.53)	(0.9884)
KZX_D_AU	32074.00	30881.00	902.00	1099.00	1092.00	5.09	0.9930
G		(19380)	(810)	(1065)	(1062)	(5.08)	(0.9879)
KZX_D_JUN	22482.00	21455.00	793.00	1048.00	1086.00	5.03	0.9893
		(19380)	(766)	(998)	(985)	(5.02)	(0.9890)
KZX_D_OCT	37014.00	36049.00	721.00	863.00	851.00	4.21	0.9955
		(19380)	(612)	(782)	(771)	(4.19)	(0.9914)
KZX_Z_APR	25370.00	24505.00	742.00	986.00	1003.00	4.52	0.9907
		(19380)	(692)	(934)	(945)	(4.5)	(0.9886)
KZX_Z_AU	25622.00	24423.00	761.00	970.00	966.00	4.85	0.9917
G		(19380)	(712)	(922)	(943)	(4.85)	(0.9896)

KZX_Z_JUN	31760.00	29415.00 (19380)	850.00 (772)	1045.00 (1009)	1050.00 (979)	4.91 (4.89)	0.9928 (0.9888)
KZX_Z_OCT	29052.00	27887.00 (19380)	712.00 (619)	942.00 (821)	915.00 (815)	4.34 (4.33)	0.9927 (0.9905)
YL_APR	24399.00	22536.00 (19380)	885.00 (853)	1103.00 (1087)	1096.00 (1089)	4.85 (4.84)	0.9893 (0.9873)
YL_AUG	25210.00	20088.00 (19380)	1012.0 0 (1003)	1160.00 (1152)	1159.00 (1148)	5.45 (5.45)	0.9895 (0.9892)
YL_JUN	25305.00	22736.00 (19380)	877.00 (829)	1176.00 (1108)	1237.00 (1147)	5.08 (5.07)	0.9881 (0.9868)
YL_OCT	23354.00	22367.00 (19380)	598.00 (576)	831.00 (819)	872.00 (901)	3.69 (3.69)	0.9910 (0.9894)

Note: * the sequence number of each sample was normalized to 19380 reads.

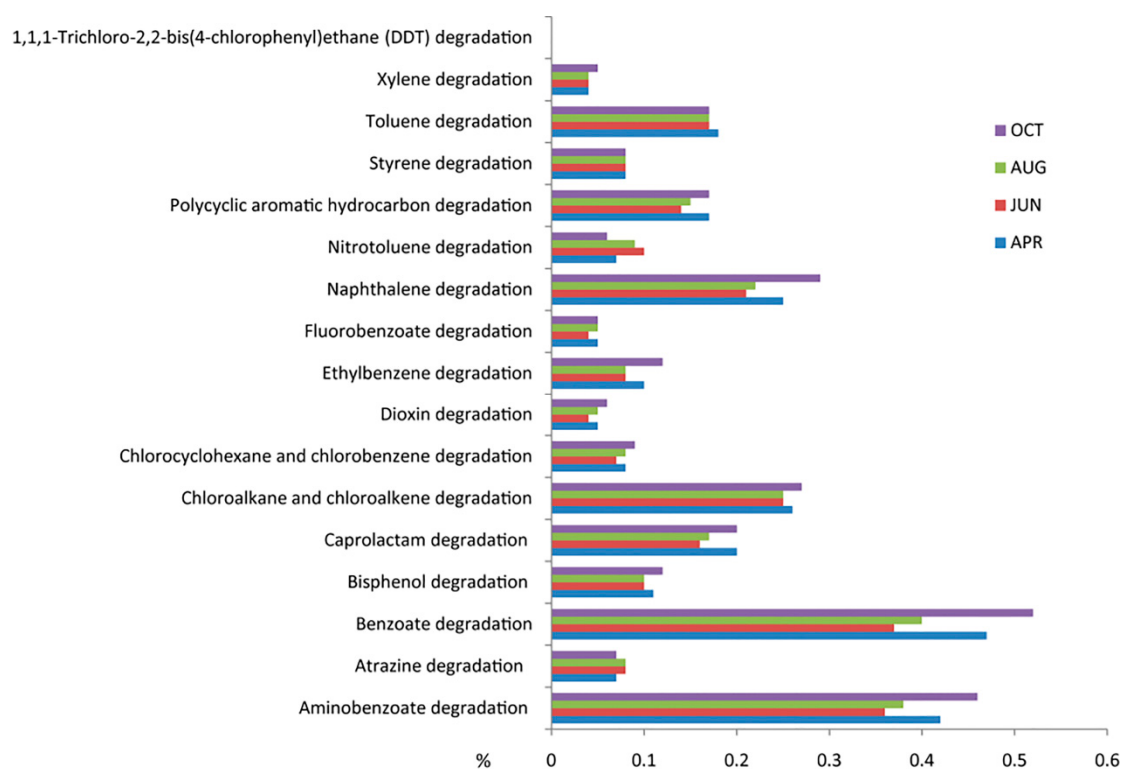


Figure S1. KEGG orthology (KO) involved in environmental sensing and xenobiotic biodegradation in Miyun Reservoir.