

**Table S1.** Brief descriptions of the parks investigated in Beijing.

Site	Construction age	Location	Tourist attraction rating
S1	Medium	Inner city	AAAA
S2	Old	Inner city	AAAA
S3	Old	Outer city	AAAA
S4	Old	Outer city	AAAAA
S5	Medium	Outer city	Non-A
S6	Medium	Outer city	AAAA
S7	Young	Outer city	Non-A
S8	Old	Inner city	AAAA
S9	Old	Inner city	Non-A
S10	Medium	Outer city	AAAA
S11	Young	Outer city	AAAAA
S12	Young	Outer city	Non-A
S13	Medium	Outer city	Non-A
S14	Medium	Outer city	Non-A
S15	Young	Outer city	AAA
S16	Medium	Inner city	Non-A

Young refers to parks aged less than 30 years, medium refers to parks aged from 30 to 100 years, and old refers to parks aged more than 100 years.

Table S2. Description of earthworm ecological characteristics in parks in Beijing.

Site	Density (ind/m ²)	Biomass (g/m ²)	Individual biomass (g/m ²)	Adult (%)	Species richness	H	D	J	1- γ	ESI	Species observed
S1	72.0	70.4	0.98	59	5	1.19	0.721	0.859	0.667	0.832	<i>M. guillelmi, D. japonica, B. parvus, O. occidentails, A. hpeiensis</i>
S2	66.7	59.9	0.90	84	4	1.14	0.737	0.821	0.652	0.816	<i>M. guillelmi, M. California, O. occidentails, A. hpeiensis</i>
S3	64.0	66.4	1.04	67	4	1.23	0.721	0.892	0.691	0.838	<i>M. shmardae, M. guillelmi, B. parvus, O. occidentails</i>
S4	59.4	24.1	0.41	54	4	1.28	0.734	0.924	0.719	0.726	<i>M. shmardae, D. japonica, B. parvus, M. californica</i>
S5	53.3	44.4	0.83	80	3	0.950	0.503	0.865	0.571	0.673	<i>M. shmardae, M. guillelmi, B. parvus</i>
S6	42.0	16.1	0.38	52	3	0.845	0.542	0.769	0.549	0.549	<i>M. guillelmi, B. parvus, M. californica</i>
S7	41.6	4.06	0.10	92	2	0.500	0.289	0.722	0.330	0.401	<i>M. guillelmi, A. hpeiensis</i>
S8	34.7	41.6	1.20	100	4	1.20	0.866	0.865	0.674	0.810	<i>M. shmardae, D. japonica, B. parvus, M. californica</i>
S9	32.0	70.0	2.19	75	2	0.562	0.289	0.811	0.387	0.630	<i>M. guillelmi, A. hpeiensis</i>
S10	32.0	43.2	1.35	100	3	0.898	0.577	0.817	0.557	0.693	<i>B. parvus, M. California, O. occidentails</i>
S11	28.8	23.9	0.83	61	4	1.34	0.924	0.968	0.756	0.763	<i>M. shmardae, M. guillelmi, D. japonica, B. parvus</i>
S12	23.1	8.91	0.39	77	4	1.33	0.955	0.961	0.755	0.722	<i>M. guillelmi, D. japonica, O. occidentails, A. robustus</i>
S13	22.9	16.8	0.74	60	2	0.662	0.344	0.955	0.496	0.481	<i>M. shmardae, M. guillelmi</i>
S14	21.3	29.9	1.40	75	2	0.693	0.327	1.00	0.525	0.560	<i>M. guillelmi, M. californica</i>
S15	19.2	21.8	1.13	83	2	0.673	0.362	0.971	0.512	0.534	<i>M. shmardae, M. guillelmi</i>
S16	5.33	2.28	0.43	100	1	0.00	0.00	0.00	0.00	0.157	<i>M. shmardae</i>

H, D, J and 1- γ refer to Shannon, Margalef, Pielou, and Simpson diversity index.