

**Table S1.** Descriptive statistics of soil chemical properties, soil microbial community characteristics and nematode community characteristics.

		Mean	standard deviation	standard error	The 95% execution interval of the mean	
					lower limit	upper limit
pH	CK	3.27	0.11	0.05	3.14	3.41
	Exotic earthworm	3.47	0.18	0.08	3.24	3.69
	Native earthworm	3.31	0.32	0.14	2.91	3.72
SM	CK	0.58	0.15	0.07	0.40	0.77
	Exotic earthworm	0.55	0.14	0.06	0.37	0.72
	Native earthworm	0.57	0.11	0.05	0.43	0.70
TC	CK	87.02	28.56	12.77	51.56	122.49
	Exotic earthworm	75.76	17.71	7.92	53.78	97.75
	Native earthworm	88.00	27.81	12.44	53.47	122.53
TN	CK	2.57	0.68	0.30	1.73	3.41
	Exotic earthworm	2.34	0.51	0.23	1.71	2.97
	Native earthworm	2.65	0.66	0.30	1.83	3.47
C/N	CK	33.31	3.26	1.46	29.26	37.36
	Exotic earthworm	32.21	2.49	1.11	29.12	35.30
	Native earthworm	32.73	3.90	1.75	27.88	37.58
AP	CK	0.83	0.42	0.19	0.30	1.35
	Exotic earthworm	0.43	0.20	0.09	0.18	0.67
	Native earthworm	0.91	0.65	0.29	0.10	1.71
NH <sub>4</sub> <sup>+</sup> -N	CK	15.92	13.96	6.24	-1.42	33.25
	Exotic earthworm	3.14	2.60	1.16	-0.09	6.38
	Native earthworm	12.44	9.24	4.13	0.97	23.92
NO <sub>3</sub> <sup>-</sup> -N	CK	80.75	21.22	9.49	54.40	107.10
	Exotic earthworm	39.29	16.87	7.54	18.35	60.24
	Native earthworm	70.78	36.91	16.50	24.95	116.60
G+ bacteria	CK	2.21	0.72	0.32	1.32	3.09
	Exotic earthworm	2.12	0.31	0.14	1.74	2.51
	Native earthworm	2.05	0.94	0.42	0.89	3.22

G- bacteria	CK	1.69	0.60	0.27	0.94	2.44
	Exotic earthworm	1.61	0.34	0.15	1.19	2.04
	Native earthworm	1.55	0.58	0.26	0.83	2.28
G+/G-	CK	1.33	0.12	0.05	1.18	1.48
	Exotic earthworm	1.34	0.10	0.05	1.21	1.47
	Native earthworm	1.30	0.15	0.07	1.12	1.49
fungi	CK	0.10	0.05	0.02	0.04	0.16
	Exotic earthworm	0.08	0.03	0.01	0.05	0.12
	Native earthworm	0.11	0.05	0.02	0.04	0.17
Total Amount	CK	8.68	2.87	1.28	5.12	12.24
	Exotic earthworm	8.03	1.29	0.57	6.43	9.62
	Native earthworm	7.82	3.07	1.37	4.00	11.63
F/B	CK	0.02	0.01	0.00	0.01	0.02
	Exotic earthworm	0.02	0.01	0.00	0.01	0.02
	Native earthworm	0.02	0.01	0.00	0.02	0.03
Bacterivores (Ba)	CK	47.47	28.95	12.95	11.52	83.41
	Exotic earthworm	21.50	12.07	5.40	6.51	36.49
	Native earthworm	128.30	157.68	70.52	-67.49	324.08
Fungivores (Fu)	CK	30.44	41.61	18.61	-21.23	82.11
	Exotic earthworm	12.12	9.76	4.37	0.00	24.24
	Native earthworm	14.14	9.98	4.46	1.75	26.53
O-P	CK	4.09	4.75	2.13	-1.81	9.99
	Exotic earthworm	3.42	4.14	1.85	-1.73	8.57
	Native earthworm	3.83	6.43	2.88	-4.15	11.81
total	CK	89.20	45.76	20.46	32.39	146.02
	Exotic earthworm	45.50	14.37	6.43	27.65	63.34
	Native earthworm	161.00	146.08	65.33	-20.38	342.38
Ba1	CK	0.58	1.30	0.58	-1.03	2.20
	Exotic earthworm	1.27	2.20	0.98	-1.46	4.00
	Native earthworm	77.85	118.56	53.02	-69.36	225.07
Ba2	CK	33.48	30.82	13.78	-4.78	71.75

genus	Exotic earthworm	6.31	6.40	2.86	-1.63	14.26
	Native earthworm	42.08	43.00	19.23	-11.3	95.47
	CK	6.20	1.92	0.86	3.81	8.59
EI	Exotic earthworm	4.25	1.48	0.66	2.41	6.09
	Native earthworm	6.40	2.61	1.17	3.16	9.64
	CK	32.81	16.37	7.32	12.49	53.14
SI	Exotic earthworm	56.31	18.81	8.41	32.95	79.67
	Native earthworm	61.13	24.08	10.77	31.23	91.03
	CK	48.40	22.90	10.24	19.96	76.83
MI	Exotic earthworm	74.66	22.44	10.03	46.80	102.51
	Native earthworm	45.18	28.82	12.89	9.40	80.96
	CK	2.32	0.17	0.08	2.11	2.54
NCR	Exotic earthworm	2.64	0.27	0.12	2.31	2.98
	Native earthworm	2.05	0.59	0.26	1.32	2.78
	CK	0.66	0.30	0.13	0.29	1.03
H'	Exotic earthworm	0.65	0.21	0.10	0.38	0.92
	Native earthworm	0.71	0.26	0.12	0.38	1.03
	CK	1.42	0.41	0.18	0.91	1.94
	Exotic earthworm	1.20	0.36	0.16	0.75	1.64
	Native earthworm	1.41	0.43	0.19	0.87	1.95

**Table S2.** Results (ANOVA) on soil chemical properties.

Treatment			P-values							
			Soil pH	SM	TC	TN	C/N	AP	NH <sub>4</sub> <sup>+</sup> -N	NO <sub>3</sub> <sup>-</sup> -N
Control	vs	Exotic earthworm	0.191	0.661	0.493	0.572	0.603	0.195	0.061	<b>0.029</b>
Control	vs	Native earthworm	0.771	0.836	0.952	0.844	0.782	0.782	0.585	0.562
Native earthworm	vs	Exotic earthworm	0.298	0.816	0.457	0.449	0.805	0.124	0.159	0.084

SM, soil moisture; TC, soil total carbon (g kg<sup>-1</sup> dry soil); TN, soil total nitrogen (g kg<sup>-1</sup> dry soil); C/N, carbon-to-nitrogen ratio; AP, available phosphorus (mg kg<sup>-1</sup> dry soil); NH<sub>4</sub><sup>+</sup>-N, nitrogen from ammonium (mg kg<sup>-1</sup> dry soil); NO<sub>3</sub><sup>-</sup>-N, nitrogen from nitrate (mg kg<sup>-1</sup> dry soil). Significant ( $P < 0.05$ ) effects were presented in bold.

**Table S3.** Results (ANOVA) on soil microbial community characteristics.

Treatment			P-values					
			G <sup>+</sup>	G <sup>-</sup>	G <sup>+</sup> /G <sup>-</sup>	Fungi	F/B	Total PLFA
Control	vs	Exotic earthworm	0.857	0.821	0.890	0.503	0.528	0.691
Control	vs	Native earthworm	0.733	0.693	0.743	0.843	0.333	0.599
Native earthworm	vs	Exotic earthworm	0.871	0.866	0.642	0.389	0.123	0.897

G<sup>+</sup>: G<sup>+</sup> bacteria; G<sup>-</sup>: G<sup>-</sup> bacteria; F/B, Fungi/(G<sup>+</sup> + G<sup>-</sup>).

**Table S4.** Soil nematode taxon list.

Genus	Guild	Treatments		
		Control	Exotic earthworm	Native earthworm
Pristionchus	Ba1	0.00±0.00	0.00±0.00	2.31±1.46
Rhaditis	Ba1	0.58±0.58	77.45±76.18	75.54±51.60
Acrobeles	Ba2	0.00±0.00	0.00±0.00	0.00±0.00
Acrobelloides	Ba2	31.76±14.41	6.04±2.51	39.74±19.87
Cervidellus	Ba2	0.00±0.00	1.70±1.70	0.74±0.74
Eucephalobus	Ba2	1.14±0.70	0.00±0.00	0.86±0.86
Plectus	Ba2	0.00±0.00	0.00±0.00	0.74±0.74
Wilsonema	Ba2	0.58±0.58	0.71±0.71	0.00±0.00
Aphanolaimus	Ba3	0.56±0.56	0.00±0.00	0.00±0.00
Metaterratocephalus	Ba3	0.00±0.00	0.00±0.00	1.39±1.39
Prismatolaimus	Ba3	12.16±3.93	5.45±4.58	6.97±3.51
Rhabdolaimus	Ba3	0.68±0.68	4.94±4.94	0.00±0.00
Alaimus	Ba4	0.00±0.00	0.74±0.74	0.00±0.00
Aphelenchoides	Fu2	14.24±8.49	9.64±5.11	5.23±1.48
Filenchus	Fu2	16.20±10.65	6.85±4.15	8.90±3.81
Miconchus	Pr4	2.85±2.22	5.43±3.49	1.60±0.99
Eudorylaimus	Om4	0.68±0.68	0.00±0.00	0.00±0.00
Thonus	Om4	0.56±0.56	0.00±0.00	2.23±2.23
Paractinolaimus	Om5	0.00±0.00	0.00±0.00	0.00±0.00
Prodorylaimus	Om5	0.00±0.00	0.71±0.71	0.00±0.00
Aglenchus	He2	0.56±0.56	2.97±2.97	3.71±3.71
Boleodorus	He2	6.64±2.19	3.80±2.33	9.18±6.21

Tylenchidae	He2	0.00±0.00	0.00±0.00	0.00±0.00
Tylenchus	He2	0.00±0.00	0.00±0.00	0.74±0.74
Helicotylenchus	He3	0.00±0.00	0.00±0.00	1.11±1.11

values are means (ind/ 100 g dry soil) ± SE, n = 5. Guild designation is the composite of trophic group and *c-p* value; Ba: bacterivores; Fu: fungivores; Om: omnivores; Pr: predators; He: herbivores.

**Table S5.** Results (ANOVA) on nematode abundances.

Treatment			P-values					
			Bacterivores	Fungivores	O-P	Total	Ba <sub>1</sub>	Ba <sub>2</sub>
Control	vs	Exotic earthworm	0.666	0.275	0.841	0.451	0.988	0.188
Control	vs	Native earthworm	0.194	0.329	0.937	0.225	0.100	0.666
Native earthworm	vs	Exotic earthworm	0.094	0.902	0.903	0.062	0.102	0.091

O-P, the sum of omnivores and predators; Ba<sub>x</sub> represents the functional guilds that reflect the nematode trophic group of bacterivores, x is the *c-p* value. No significant differences among treatments were found ( $P < 0.05$ ).

**Table S6.** Results (ANOVA) on nematode community characteristics.

Treatment			P-values					
			genus	EI	SI	MI	NCR	<i>H'</i>
Control	vs	Exotic earthworm	0.160	0.088	0.121	0.213	0.952	0.392
Control	vs	Native earthworm	0.880	<b>0.045</b>	0.842	0.285	0.785	0.957
Native earthworm	vs	Exotic earthworm	0.124	0.710	0.086	<b>0.0314</b>	0.739	0.421

EI, Enrichment index; SI, Structure index; MI, Maturity index; NCR, nematode channel ratio; *H'*, Shannon-Wiener index. Significant ( $P < 0.05$ ) effects were presented in bold.