

SUPPLEMENTARY MATERIAL

Supplementary Material 1. List of sites where field surveys were conducted to investigate the species composition of terrestrial gastropods in southern Ibaraki Prefecture, Japan. See Fig. 1 for a map of geographic locations.

Site ID	Sampling date	Latitude	Longitude	City	<i>Limax maximus</i>
A	2021.7.9.	36.0882 N	140.1063 E	Tsukuba	Recorded
B	2021.7.9.	36.0861 N	140.1051 E	Tsukuba	Recorded
C	2021.7.9.	36.0986 N	140.1050 E	Tsukuba	
D	2021.7.20.	36.1098 N	140.1025 E	Tsukuba	
E	2021.7.26.	37.1137 N	140.0994 E	Tsukuba	
F	2021.9.25.	36.1111 N	140.0785 E	Tsukuba	Recorded
G	2021.9.25.	36.0857 N	140.0432 E	Tsukuba	Recorded
H	2021.9.25.	36.0891 N	140.1764 E	Tsuchiura	Recorded
I	2021.9.26.	36.1748 N	140.3053 E	Ishioka	Recorded
J	2021.9.26.	36.1652 N	140.3302 E	Omitama	Recorded
K	2021.9.26.	36.1560 N	140.3366 E	Omitama	
L	2021.9.26.	36.1588 N	140.3418 E	Omitama	Recorded
M	2021.10.5.	36.1103 N	140.1279 E	Tsukuba	
N	2021.10.6.	36.1086 N	140.1120 E	Tsukuba	

O	2021.10.6.	36.0836 N	140.1118 E	Tsukuba	
P	2022.10.1.	36.1182 N	140.2302 E	Tsuchiura	
Q	2022.10.10.	36.1206 N	140.2302 E	Tsuchiura	
R	2022.10.22.	36.0954 N	140.2000 E	Tsuchiura	
S	2022.10.22.	36.1127 N	140.2627 E	Tsuchiura	
T	2022.10.24.	36.1455 N	140.2903 E	Ishioka	Recorded
U	2022.11.4.	36.1077 N	140.0487 E	Tsukuba	Recorded

Supplementary Material 2. List of samples and their nitrogen and carbon isotope ratios, obtained by stable isotope analyses. The samples were collected at urban and rural sites in Ibaraki Prefecture, Japan.

Sample ID	Site category ¹⁾	Sample category	Taxonomic Group		Species	N%	C%	d15Ncor r	d13Ccor r
1	Urban	Aerial algae	Aerial algae			4.00%	32.10%	1.378987	-28.3716
2	Urban	Aerial algae	Aerial algae			5.10%	50.10%	-3.94482	-30.7476
3	Urban	Aerial algae	Aerial algae			3.50%	38.30%	-4.65006	-25.5146
4	Urban	Aerial algae	Aerial algae			3.50%	35.20%	-4.2324	-26.2166
5	Urban	Animal	Carrion beetle	<i>Eusilpha japonica</i>		10.40%	41.20%	1.71348	-25.763
6	Urban	Animal	Carrion beetle	<i>Eusilpha japonica</i>		10.10%	39.20%	2.968232	-25.1281
7	Urban	Animal	Bipalium	<i>Bipalium nobile</i>		10.60%	45.50%	-0.12972	-25.2413
8	Urban	Animal	Cicada	<i>Tanna japonensis</i>		11.40%	47.50%	4.264438	-28.0326
9	Urban	Animal	Cicada	<i>Tanna japonensis</i>		10.20%	49.90%	1.082565	-28.0923

10	Urban	Animal	Cicada	<i>Graptopsaltria nigrofuscata</i>	11.70%	49.00%	5.663775	-27.42
11	Urban	Animal	Cicada	<i>Graptopsaltria nigrofuscata</i>	10.90%	46.40%	2.328217	-27.6353
12	Urban	Animal	Cicada	<i>Hyalessa maculaticollis</i>	10.00%	51.70%	6.227958	-25.8823
13	Urban	Animal	Cicada	<i>Hyalessa maculaticollis</i>	11.90%	50.40%	0.55478	-27.4291
14	Urban	Animal	Earthworm		7.10%	46.40%	0.255507	-27.8363
15	Urban	Animal	Earthworm		4.10%	23.60%	2.429325	-26.5817
16	Urban	Animal	Earthworm		10.10%	44.70%	0.530116	-26.3967
17	Urban	Animal	Earthworm		7.60%	44.80%	0.436224	-27.347
18	Urban	Animal	Earthworm		5.90%	43.80%	0.650257	-28.5541
19	Urban	Animal	Earthworm		8.60%	46.10%	0.260555	-27.255
20	Urban	Animal	Grasshopper	<i>Atractomorpha lata</i>	10.70%	45.70%	-1.47796	-34.1395
21	Urban	Animal	Grasshopper	<i>Atractomorpha lata</i>	11.40%	46.90%	-1.86463	-35.4244

22	Urban	Animal	Grasshopper	<i>Atractomorpha lata</i>	12.80%	47.10%	-0.35731	-29.5984
23	Urban	Animal	Grasshopper	<i>Atractomorpha lata</i>	11.60%	48.80%	-0.17256	-32.5827
24	Urban	Animal	Grasshopper	<i>Atractomorpha lata</i>	9.60%	47.00%	0.146471	-31.0127
25	Urban	Animal	Grasshopper	<i>Atractomorpha lata</i>	11.60%	48.20%	-0.851	-31.7618
26	Urban	Animal	Millipede		4.70%	24.30%	0.400888	-23.6429
27	Urban	Animal	Millipede		4.80%	27.20%	-2.54914	-25.1694
28	Urban	Animal	Millipede		4.90%	29.10%	0.208057	-25.6375
29	Urban	Animal	Millipede		5.10%	29.70%	-0.3653	-25.4202
30	Urban	Animal	Millipede		3.90%	22.60%	0.305043	-25.039
31	Urban	Animal	Millipede		4.40%	26.80%	0.247412	-25.0643
32	Urban	Animal	Pillbug		6.50%	33.40%	1.437739	-25.5556
33	Urban	Animal	Pillbug		5.30%	30.30%	2.894578	-25.1796

34	Urban	Animal	Pillbug		5.90%	30.90%	2.589682	-26.3927
35	Urban	Animal	Pillbug		4.50%	27.00%	1.238849	-25.2584
36	Urban	Animal	Pillbug		5.20%	30.20%	0.512315	-25.2109
37	Urban	Animal	Pillbug		8.00%	44.00%	0.263584	-27.3955
38	Urban	Animal	Scarab beetle	<i>Anomala albopilosa</i>	11.20%	45.30%	0.902655	-27.9515
39	Urban	Animal	Scarab beetle	<i>Anomala albopilosa</i>	10.90%	46.60%	2.616941	-24.4719
40	Urban	Animal	Scarab beetle	<i>Anomala albopilosa</i>	10.70%	46.70%	2.992509	-27.3126
41	Urban	Animal	Scarab beetle	<i>Anomala albopilosa</i>	10.20%	49.10%	2.946068	-24.4658
42	Urban	Animal	Scarab beetle	<i>Anomala albopilosa</i>	10.70%	47.30%	2.378677	-28.3337
43	Urban	Animal	Scarab beetle	<i>Anomala albopilosa</i>	9.90%	49.60%	1.633599	-29.9512
44	Urban	Animal	Spider		11.50%	50.60%	4.724967	-26.24
45	Urban	Animal	Spider		11.50%	51.30%	2.992509	-28.5247

7	46	Urban	Animal	Spider	12.40%	45.00%	2.473579	-26.9204
	47	Urban	Animal	Spider	13.20%	48.00%	4.639152	-26.9376
	48	Urban	Animal	Spider	11.60%	49.20%	0.370601	-28.2953
	49	Urban	Animal	Spider	11.40%	49.70%	0.601797	-28.3104
	50	Urban	Bryophyte	Bryophyte	2.20%	40.40%	-5.59308	-29.4044
	51	Urban	Bryophyte	Bryophyte	2.50%	38.80%	-3.06179	-27.2993
	52	Urban	Bryophyte	Bryophyte	2.80%	40.10%	-1.08933	-29.4044
	53	Urban	Bryophyte	Bryophyte	1.60%	39.30%	-3.43088	-32.4844
	54	Urban	Bryophyte	Bryophyte	1.90%	42.00%	-12.0957	-28.5987
	55	Urban	Bryophyte	Bryophyte	2.40%	43.70%	-11.2192	-29.664
	56	Urban	Lichen	Lichen	2.70%	44.40%	-7.38055	-27.4016
	57	Urban	Lichen	Lichen	2.10%	45.90%	-8.29513	-27.8521

∞	58	Urban	Lichen	Lichen	1.20%	31.30%	-2.74064	-28.0763
	59	Urban	Lichen	Lichen	2.90%	45.00%	-2.0542	-28.2674
	60	Urban	Lichen	Lichen	2.10%	43.80%	-10.4942	-28.4655
	61	Urban	Lichen	Lichen	3.90%	40.10%	-0.85614	-27.6086
	62	Urban	Litter	Litter	0.80%	43.80%	-2.66442	-28.0236
	63	Urban	Litter	Litter	1.60%	38.70%	-2.575	-30.4486
	64	Urban	Litter	Litter	0.80%	45.90%	-3.30462	-30.4346
	65	Urban	Litter	Litter	0.70%	44.60%	-2.71625	-27.0146
	66	Urban	Litter	Litter	1.00%	45.90%	-2.56077	-30.8126
	67	Urban	Litter	Litter	1.10%	42.80%	-1.76205	-30.9696
	68	Urban	Mushroom	Mushroom	3.80%	39.50%	8.215337	-26.796
	69	Urban	Mushroom	Mushroom	5.60%	43.60%	-1.24563	-23.8352

70	Urban	Mushroom	Mushroom		4.70%	56.40%	7.383715	-26.6232
71	Urban	Mushroom	Mushroom		4.10%	39.60%	1.484079	-22.1557
72	Urban	Mushroom	Mushroom		6.30%	42.80%	2.065605	-24.5243
73	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Limax maximus</i>	10.50%	43.60%	3.921331	-23.9123
74	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Limax maximus</i>	8.40%	45.20%	4.12809	-26.9959
75	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Limax maximus</i>	9.70%	45.30%	-0.06257	-25.657
76	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Limax maximus</i>	8.90%	44.50%	2.72616	-26.9533
77	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Limax maximus</i>	9.00%	45.40%	1.264723	-26.8225

78	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Limax maximus</i>	9.70%	45.50%	1.130581	-27.3793
79	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Limax maximus</i>	7.00%	41.20%	3.113456	-26.5973
80	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Limax maximus</i>	8.20%	45.40%	4.362081	-26.7971
81	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Limax maximus</i>	10.30%	44.80%	3.78618	-26.8681
82	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Limax maximus</i>	8.70%	44.30%	2.226911	-26.2696
83	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Limax maximus</i>	10.70%	46.00%	1.846675	-26.1956

84	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Limax maximus</i>	9.50%	45.40%	2.200688	-27.0781
85	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Acusta sieboldtiana</i>	9.30%	43.80%	-0.48113	-26.5192
86	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Acusta sieboldtiana</i>	9.90%	44.80%	-0.01618	-26.6876
87	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Acusta sieboldtiana</i>	9.70%	44.40%	0.725131	-26.1642
88	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Acusta sieboldtiana</i>	8.60%	44.20%	0.643436	-27.2434
89	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Acusta sieboldtiana</i>	9.20%	42.10%	-1.5351	-29.8523

90	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Acusta sieboldtiana</i>	8.20%	41.20%	-1.92038	-30.2053
91	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Acusta sieboldtiana</i>	9.50%	43.80%	-0.20882	-26.6865
92	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Acusta sieboldtiana</i>	9.40%	43.90%	1.594529	-25.7797
93	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Acusta sieboldtiana</i>	10.50%	43.90%	2.12807	-26.8123
94	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Acusta sieboldtiana</i>	10.60%	43.60%	-1.73379	-27.5934
95	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Acusta sieboldtiana</i>	8.70%	43.10%	1.845667	-26.5973

96	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Acusta sieboldtiana</i>	8.00%	42.70%	1.691353	-25.4206
97	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Ambigolimax valentianus</i>	9.80%	44.70%	-0.71413	-25.5557
98	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Ambigolimax valentianus</i>	9.60%	43.00%	3.811474	-27.1217
99	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Ambigolimax valentianus</i>	9.80%	45.70%	1.786278	-27.4645
100	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Ambigolimax valentianus</i>	12.30%	45.00%	0.645778	-28.621
101	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Ambigolimax valentianus</i>	9.50%	44.90%	-0.3653	-25.032

102	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Ambigolimax valentianus</i>	9.40%	44.60%	0.057328	-26.9084
103	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Ambigolimax valentianus</i>	8.80%	45.70%	2.529422	-28.8121
104	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Ambigolimax valentianus</i>	7.80%	43.90%	2.843869	-27.9265
105	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Ambigolimax valentianus</i>	7.50%	48.60%	2.491001	-29.3762
106	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Ambigolimax valentianus</i>	9.40%	44.60%	2.1624	-27.4169
107	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Ambigolimax valentianus</i>	8.50%	46.30%	2.753883	-28.1661

108	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Ambigolimax valentianus</i>	9.10%	42.90%	1.791333	-27.4877
109	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Meghimatium bilineatum</i>	9.90%	46.10%	-3.50487	-26.4999
110	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Meghimatium bilineatum</i>	9.20%	44.50%	-1.18412	-25.7716
111	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Meghimatium bilineatum</i>	10.00%	43.70%	-1.288	-25.2523
112	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Meghimatium bilineatum</i>	9.90%	47.30%	-7.8095	-27.4219
113	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Meghimatium bilineatum</i>	10.50%	45.60%	-1.80339	-26.7403

114	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Meghimatium bilineatum</i>	7.90%	47.60%	-5.51396	-28.843
115	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Meghimatium bilineatum</i>	8.20%	43.80%	-6.68392	-27.6055
116	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Meghimatium bilineatum</i>	7.60%	45.10%	-6.15845	-29.2265
117	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Meghimatium bilineatum</i>	10.90%	46.20%	-5.39899	-27.9169
118	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Meghimatium bilineatum</i>	9.50%	45.00%	-8.09896	-26.1317
119	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Meghimatium bilineatum</i>	10.50%	46.50%	-7.75604	-25.2959

120	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Meghimatium bilineatum</i>	8.90%	44.10%	-1.84676	-25.5454
121	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Euhadra brandtii</i>	12.60%	47.20%	-3.76105	-25.3567
122	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Euhadra brandtii</i>	10.80%	44.40%	-6.98448	-25.9511
123	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Euhadra brandtii</i>	11.20%	44.70%	-7.88615	-26.8255
124	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Euhadra brandtii</i>	10.70%	42.30%	-5.66525	-26.0769
125	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Euhadra brandtii</i>	10.70%	45.00%	-5.58658	-26.6236

126	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Euhadra brandtii</i>	12.10%	47.30%	-4.39746	-26.5019
127	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Euhadra brandtii</i>	12.10%	47.00%	-4.65062	-25.9035
128	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Euhadra brandtii</i>	11.90%	47.30%	-4.94008	-25.5525
129	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Euhadra brandtii</i>	12.40%	45.90%	-2.87349	-25.1143
130	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Euhadra brandtii</i>	11.70%	45.00%	-6.74746	-26.9624
131	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Euhadra brandtii</i>	5.40%	21.50%	-7.47566	-25.4531

132	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Euhadra brandtii</i>	10.60%	43.80%	-5.83772	-25.6347
133	Urban	Terrestrial gastropod	Terrestrial gastropod	<i>Zonitoides arboreus</i>	10.10%	42.20%	2.174558	-24.8338
134	Urban	Vascular plants	Vascular plants	<i>Digitaria ciliaris</i>	1.30%	39.80%	-3.40916	-12.2061
135	Urban	Vascular plants	Vascular plants	<i>Digitaria ciliaris</i>	2.30%	39.50%	-2.39467	-12.9033
136	Urban	Vascular plants	Vascular plants	<i>Digitaria ciliaris</i>	2.70%	41.00%	-1.83018	-12.2071
137	Urban	Vascular plants	Vascular plants	<i>Houttuynia cordata</i>	1.70%	39.80%	-3.35238	-30.1976
138	Urban	Vascular plants	Vascular plants	<i>Houttuynia cordata</i>	1.40%	41.10%	-1.10966	-29.4156
139	Urban	Vascular plants	Vascular plants	<i>Houttuynia cordata</i>	1.60%	40.10%	-1.44906	-28.9706
140	Urban	Vascular plants	Vascular plants	<i>Quercus serrata</i>	1.70%	43.50%	-1.00092	-28.9396
141	Urban	Vascular plants	Vascular plants	<i>Quercus serrata</i>	1.60%	43.20%	-1.70616	-29.2266

142	Urban	Vascular plants	Vascular plants	<i>Quercus serrata</i>	1.80%	45.40%	-2.84327	-29.7166
143	Urban	Vascular plants	Vascular plants	<i>Quercus myrsinifolia</i>	1.40%	44.20%	-1.41553	-31.7776
144	Urban	Vascular plants	Vascular plants	<i>Quercus myrsinifolia</i>	1.70%	46.60%	-1.54052	-32.4946
145	Urban	Vascular plants	Vascular plants	<i>Quercus myrsinifolia</i>	1.70%	46.20%	-1.46329	-32.5716
146	Urban	Vascular plants	Vascular plants	<i>Chamaecyparis obtusa</i>	0.90%	46.40%	-2.58008	-29.4666
147	Urban	Vascular plants	Vascular plants	<i>Chamaecyparis obtusa</i>	0.90%	48.80%	-3.48652	-27.2586
148	Urban	Vascular plants	Vascular plants	<i>Chamaecyparis obtusa</i>	1.00%	49.50%	-3.3595	-27.2356
149	Urban	Vascular plants	Vascular plants	<i>Taraxacum officinale</i>	2.40%	36.30%	-3.21317	-32.8536
150	Urban	Vascular plants	Vascular plants	<i>Taraxacum officinale</i>	2.00%	36.50%	-2.49777	-33.5956
151	Urban	Vascular plants	Vascular plants	<i>Pueraria lobata</i>	2.90%	42.30%	-1.9287	-29.2766
152	Urban	Vascular plants	Vascular plants	<i>Pueraria lobata</i>	3.10%	40.50%	-1.194	-30.7316
153	Urban	Vascular plants	Vascular plants	<i>Pueraria lobata</i>	4.00%	42.20%	-1.36777	-28.6286

154	Rural	Aerial algae	Aerial algae		3.80%	37.30%	-9.62328	-31.0846
155	Rural	Aerial algae	Aerial algae		3.50%	37.90%	-8.24431	-31.3176
156	Rural	Aerial algae	Aerial algae		3.90%	40.70%	-7.62444	-30.5356
157	Rural	Aerial algae	Aerial algae		3.30%	35.40%	-9.07759	-31.3956
158	Rural	Aerial algae	Aerial algae		3.50%	36.10%	-10.3112	-31.5356
159	Rural	Aerial algae	Aerial algae		3.80%	38.00%	1.848466	-28.6256
160	Rural	Animal	Carrion beetle	<i>Eusilpha japonica</i>	10.20%	43.40%	3.438385	-24.9097
161	Rural	Animal	Carrion beetle	<i>Eusilpha japonica</i>	10.00%	46.30%	2.936888	-25.4233
162	Rural	Animal	Carrion beetle	<i>Eusilpha japonica</i>	9.50%	49.70%	6.090451	-25.5133
163	Rural	Animal	Carrion beetle	<i>Eusilpha japonica</i>	10.90%	43.60%	3.053163	-25.3394
164	Rural	Animal	Carrion beetle	<i>Eusilpha japonica</i>	10.50%	40.60%	3.563759	-24.9956
165	Rural	Animal	Carrion beetle	<i>Eusilpha japonica</i>	10.00%	39.30%	4.977251	-23.5722

166	Rural	Animal	Carabids	<i>Promethis valgipes</i>	11.00%	50.90%	2.181525	-22.8929
167	Rural	Animal	Carabids	<i>Promethis valgipes</i>	8.80%	46.20%	2.373156	-27.1349
168	Rural	Animal	Carabids	<i>Chlaenius costiger</i>	10.60%	40.00%	2.699936	-25.306
169	Rural	Animal	Carabids	<i>Carabus blaptoides</i>	10.40%	54.60%	4.006051	-28.8207
170	Rural	Animal	Carabids	<i>Pheropsophus jessoensis</i>	8.10%	57.90%	8.439783	-30.4802
171	Rural	Animal	Carabids	<i>Pheropsophus jessoensis</i>	8.10%	56.30%	8.957186	-28.7801
172	Rural	Animal	Cicada	<i>Tanna japonensis</i>	11.50%	48.10%	3.960103	-26.7244
173	Rural	Animal	Cicada	<i>Graptopsaltria nigrofuscata</i>	9.90%	49.00%	1.761001	-29.3338
174	Rural	Animal	Cicada	<i>Tanna japonensis</i>	9.90%	51.40%	6.021698	-29.4338
175	Rural	Animal	Earthworm		7.20%	46.20%	4.555356	-28.3175
176	Rural	Animal	Earthworm		7.00%	42.40%	0.628046	-28.0547
177	Rural	Animal	Earthworm		7.30%	43.90%	1.993014	-28.2983

178	Rural	Animal	Earthworm		8.20%	45.40%	3.990994	-27.4633
179	Rural	Animal	Earthworm		8.70%	46.60%	2.247431	-27.6412
180	Rural	Animal	Earthworm		9.30%	45.30%	4.404927	-27.2965
181	Rural	Animal	Grasshopper	<i>Atractomorpha lata</i>	11.60%	48.30%	5.872872	-30.7387
182	Rural	Animal	Grasshopper	<i>Atractomorpha lata</i>	12.30%	46.20%	5.703261	-31.3139
183	Rural	Animal	Grasshopper	<i>Atractomorpha lata</i>	11.80%	48.10%	7.23582	-30.1534
184	Rural	Animal	Grasshopper	<i>Atractomorpha lata</i>	11.30%	50.60%	3.321636	-30.9166
185	Rural	Animal	Grasshopper	<i>Atractomorpha lata</i>	12.40%	48.40%	4.466512	-29.4336
186	Rural	Animal	Grasshopper	<i>Atractomorpha lata</i>	12.60%	44.30%	4.995538	-29.9401
187	Rural	Animal	Millipede		4.90%	27.60%	4.902655	-24.8874
188	Rural	Animal	Millipede		4.30%	26.40%	3.948592	-24.9187
189	Rural	Animal	Millipede		5.40%	28.10%	3.749702	-25.1563

190	Rural	Animal	Millipede		5.60%	27.10%	2.571509	-23.8219
191	Rural	Animal	Millipede		2.00%	9.30%	5.92059	-25.6203
192	Rural	Animal	Millipede		5.80%	30.30%	1.642686	-25.5243
193	Rural	Animal	Pillbug		4.90%	31.90%	3.549803	-27.1863
194	Rural	Animal	Pillbug		4.80%	24.80%	5.662877	-25.8144
195	Rural	Animal	Pillbug		5.30%	29.70%	1.845613	-25.3848
196	Rural	Animal	Pillbug		5.70%	32.10%	1.859748	-27.6887
197	Rural	Animal	Pillbug		5.10%	29.40%	3.267118	-26.7728
198	Rural	Animal	Pillbug		4.70%	26.70%	1.92739	-25.4707
199	Rural	Animal	Scarab beetle	<i>Anomala albopilosa</i>	10.60%	49.50%	1.472065	-29.3042
200	Rural	Animal	Scarab beetle	<i>Anomala albopilosa</i>	11.20%	51.60%	4.885492	-29.292
201	Rural	Animal	Scarab beetle	<i>Anomala albopilosa</i>	10.80%	50.70%	7.069238	-29.659

202	Rural	Animal	Scarab beetle	<i>Anomala albopilosa</i>	12.30%	46.60%	4.406946	-23.1698
203	Rural	Animal	Scarab beetle	<i>Anomala albopilosa</i>	11.30%	46.00%	2.151519	-28.0162
204	Rural	Animal	Scarab beetle	<i>Anomala albopilosa</i>	10.80%	48.90%	3.031883	-24.2768
205	Rural	Animal	Spider		13.00%	51.70%	8.577567	-23.7905
206	Rural	Animal	Spider		13.30%	46.90%	8.144452	-29.014
207	Rural	Animal	Spider		14.60%	46.50%	8.628046	-25.9479
208	Rural	Animal	Spider		12.00%	47.50%	8.874387	-27.2287
209	Rural	Animal	Spider		11.10%	49.80%	6.632085	-27.3187
210	Rural	Animal	Spider		11.80%	50.10%	5.333751	-27.8029
211	Rural	Bryophyte	Bryophyte		2.30%	40.60%	-6.83079	-29.4225
212	Rural	Bryophyte	Bryophyte		2.20%	42.20%	-6.79726	-29.7755
213	Rural	Bryophyte	Bryophyte		1.20%	24.10%	2.524231	-30.1083

214	Rural	Bryophyte	Bryophyte	1.90%	29.60%	2.370903	-30.918
215	Rural	Bryophyte	Bryophyte	3.10%	40.20%	-4.57761	-29.6165
216	Rural	Bryophyte	Bryophyte	1.80%	30.00%	2.044251	-30.7301
217	Rural	Lichen	Lichen	1.90%	41.80%	-7.94149	-26.7431
218	Rural	Lichen	Lichen	1.50%	47.30%	-12.3619	-27.0487
219	Rural	Lichen	Lichen	1.20%	48.10%	-8.41149	-26.5183
220	Rural	Lichen	Lichen	1.40%	47.30%	-8.41149	-25.9915
221	Rural	Lichen	Lichen	2.10%	43.60%	-7.44347	-24.2233
222	Rural	Lichen	Lichen	1.90%	43.90%	-9.92247	-24.4203
223	Rural	Lichen	Lichen	1.20%	44.30%	-10.2205	-24.96
224	Rural	Litter	Litter	2.20%	45.00%	-3.15321	-31.4556
225	Rural	Litter	Litter	1.90%	44.90%	-3.13695	-31.1316

226	Rural	Litter	Litter	2.00%	44.80%	-3.22638	-31.1646
227	Rural	Litter	Litter	1.50%	39.80%	-2.1228	-30.9696
228	Rural	Litter	Litter	1.50%	41.20%	-3.06379	-30.7126
229	Rural	Litter	Litter	1.50%	40.80%	-2.13804	-31.2186
230	Rural	Mushroom	Mushroom	6.10%	42.30%	4.388801	-26.3376
231	Rural	Mushroom	Mushroom	4.70%	44.30%	3.483883	-27.2779
232	Rural	Mushroom	Mushroom	4.30%	40.10%	2.542567	-27.8145
233	Rural	Mushroom	Mushroom	6.20%	40.90%	4.20074	-26.3538
234	Rural	Mushroom	Mushroom	4.90%	40.30%	4.616295	-26.7616
235	Rural	Mushroom	Mushroom	4.80%	41.30%	1.653826	-28.2689
236	Rural	Mushroom	Mushroom	5.80%	41.20%	5.687938	-25.7673
237	Rural	Mushroom	Mushroom	6.40%	42.30%	3.693266	-24.3081

238	Rural	Terrestrial gastropod	Terrestrial gastropod	<i>Limax maximus</i>	10.90%	46.90%	6.623324	-26.2585
239	Rural	Terrestrial gastropod	Terrestrial gastropod	<i>Limax maximus</i>	8.70%	40.80%	6.252166	-25.8416
240	Rural	Terrestrial gastropod	Terrestrial gastropod	<i>Limax maximus</i>	8.60%	45.70%	4.965214	-26.3599
241	Rural	Terrestrial gastropod	Terrestrial gastropod	<i>Limax maximus</i>	11.40%	47.50%	2.809872	-25.8456
242	Rural	Terrestrial gastropod	Terrestrial gastropod	<i>Limax maximus</i>	10.10%	47.00%	6.043389	-27.1369
243	Rural	Terrestrial gastropod	Terrestrial gastropod	<i>Limax maximus</i>	8.40%	45.10%	5.689377	-27.0334

244	Rural	Terrestrial gastropod	Terrestrial gastropod	<i>Limax maximus</i>	9.10%	46.50%	4.439742	-26.79
245	Rural	Terrestrial gastropod	Terrestrial gastropod	<i>Limax maximus</i>	9.90%	48.40%	5.820492	-26.6876
246	Rural	Terrestrial gastropod	Terrestrial gastropod	<i>Limax maximus</i>	10.30%	48.40%	5.055986	-26.5131
247	Rural	Terrestrial gastropod	Terrestrial gastropod	<i>Limax maximus</i>	8.80%	46.60%	6.259226	-26.1408
248	Rural	Terrestrial gastropod	Terrestrial gastropod	<i>Limax maximus</i>	9.50%	47.50%	3.099335	-24.8384
249	Rural	Terrestrial gastropod	Terrestrial gastropod	<i>Limax maximus</i>	10.20%	47.40%	5.773089	-26.648

250	Rural	Terrestrial gastropod	Terrestrial gastropod	<i>Limax maximus</i>	8.70%	40.80%	6.252166	-25.8416
251	Rural	Terrestrial gastropod	Terrestrial gastropod	<i>Limax maximus</i>	8.60%	45.70%	4.965214	-26.3599
252	Rural	Terrestrial gastropod	Terrestrial gastropod	<i>Limax maximus</i>	11.40%	47.50%	2.809872	-25.8456
253	Rural	Terrestrial gastropod	Terrestrial gastropod	<i>Ambigolimax valentianus</i>	8.60%	45.60%	3.580842	-26.5155
254	Rural	Terrestrial gastropod	Terrestrial gastropod	<i>Ambigolimax valentianus</i>	8.10%	44.20%	2.931438	-26.3667
255	Rural	Terrestrial gastropod	Terrestrial gastropod	<i>Bradybaena pellucida</i>	9.70%	45.00%	6.29478	-28.1235

256	Rural	Terrestrial gastropod	Terrestrial gastropod	<i>Bradybaena pellucida</i>	10.30%	46.20%	4.139207	-27.404
257	Rural	Terrestrial gastropod	Terrestrial gastropod	<i>Bradybaena pellucida</i>	9.50%	44.10%	5.029355	-27.9687
258	Rural	Terrestrial gastropod	Terrestrial gastropod	<i>Bradybaena pellucida</i>	9.80%	45.20%	4.969674	-27.2593
259	Rural	Terrestrial gastropod	Terrestrial gastropod	<i>Bradybaena pellucida</i>	10.40%	45.70%	5.306514	-27.3362
260	Rural	Terrestrial gastropod	Terrestrial gastropod	<i>Bradybaena pellucida</i>	10.00%	45.40%	5.122416	-27.3676
261	Rural	Terrestrial gastropod	Terrestrial gastropod	<i>Bradybaena pellucida</i>	9.80%	43.50%	3.324924	-26.2463

262	Rural	Terrestrial gastropod	Terrestrial gastropod	<i>Bradybaena pellucida</i>	8.10%	43.90%	5.047562	-28.3775
263	Rural	Terrestrial gastropod	Terrestrial gastropod	<i>Bradybaena pellucida</i>	11.80%	50.90%	4.969674	-28.0335
264	Rural	Terrestrial gastropod	Terrestrial gastropod	<i>Bradybaena pellucida</i>	9.90%	43.40%	5.259984	-28.0972
265	Rural	Terrestrial gastropod	Terrestrial gastropod	<i>Bradybaena pellucida</i>	10.20%	45.10%	5.110277	-28.075
266	Rural	Terrestrial gastropod	Terrestrial gastropod	<i>Bradybaena pellucida</i>	10.00%	45.10%	4.906959	-27.1399
267	Rural	Terrestrial gastropod	Terrestrial gastropod	<i>Succinea lauta</i>	7.70%	42.00%	5.18983	-27.6874

268	Rural	Terrestrial gastropod	Terrestrial gastropod	<i>Succinea lauta</i>	6.70%	43.00%	5.759281	-27.5639
269	Rural	Terrestrial gastropod	Terrestrial gastropod	<i>Succinea lauta</i>	7.20%	42.30%	5.608367	-27.7522
270	Rural	Terrestrial gastropod	Terrestrial gastropod	<i>Succinea lauta</i>	8.30%	43.30%	4.050929	-27.5153
271	Rural	Terrestrial gastropod	Terrestrial gastropod	<i>Succinea lauta</i>	8.20%	43.50%	4.133429	-27.738
272	Rural	Terrestrial gastropod	Terrestrial gastropod	<i>Succinea lauta</i>	9.70%	42.30%	4.340685	-27.1165
273	Rural	Terrestrial gastropod	Terrestrial gastropod	<i>Succinea lauta</i>	9.80%	43.80%	5.573153	-28.0194

274	Rural	Terrestrial gastropod	Terrestrial gastropod	<i>Succinea lauta</i>	8.40%	43.40%	4.469465	-28.0153
275	Rural	Terrestrial gastropod	Terrestrial gastropod	<i>Succinea lauta</i>	8.90%	44.30%	5.110349	-27.7511
276	Rural	Terrestrial gastropod	Terrestrial gastropod	<i>Succinea lauta</i>	9.30%	43.00%	5.911202	-28.1915
277	Rural	Vascular plants	Vascular plants	<i>Digitaria ciliaris</i>	3.00%	40.70%	5.132151	-12.3536
278	Rural	Vascular plants	Vascular plants	<i>Digitaria ciliaris</i>	2.80%	42.30%	4.506479	-12.7538
279	Rural	Vascular plants	Vascular plants	<i>Digitaria ciliaris</i>	3.60%	41.30%	3.899557	-12.3576
280	Rural	Vascular plants	Vascular plants	<i>Persicaria thunbergii</i>	3.40%	41.40%	3.944953	-31.2889
281	Rural	Vascular plants	Vascular plants	<i>Brassica rapa</i>	5.90%	40.40%	6.564092	-30.8837
282	Rural	Vascular plants	Vascular plants	<i>Trichosanthes cucumeroides</i>	3.10%	42.90%	6.036119	-29.2426

283	Rural	Vascular plants	Vascular plants	<i>Boehmeria nivea</i>	2.80%	37.50%	2.769597	-29.9247
284	Rural	Vascular plants	Vascular plants	<i>Houttuynia cordata</i>	1.90%	39.30%	-4.83195	-32.6776
285	Rural	Vascular plants	Vascular plants	<i>Houttuynia cordata</i>	2.60%	40.80%	-4.18261	-32.5546
286	Rural	Vascular plants	Vascular plants	<i>Houttuynia cordata</i>	2.60%	41.00%	-4.06575	-33.8326
287	Rural	Vascular plants	Vascular plants	<i>Quercus serrata</i>	2.00%	43.10%	-3.29446	-32.3446
288	Rural	Vascular plants	Vascular plants	<i>Quercus serrata</i>	1.60%	43.80%	-0.8485	-32.3746
289	Rural	Vascular plants	Vascular plants	<i>Quercus serrata</i>	2.00%	44.60%	-3.01603	-33.3486
290	Rural	Vascular plants	Vascular plants	<i>Quercus myrsinifolia</i>	1.40%	43.90%	-0.60664	-32.5966
291	Rural	Vascular plants	Vascular plants	<i>Quercus myrsinifolia</i>	1.70%	45.50%	-0.89931	-34.1316
292	Rural	Vascular plants	Vascular plants	<i>Quercus myrsinifolia</i>	1.60%	44.70%	-0.65949	-33.3586
293	Rural	Vascular plants	Vascular plants	<i>Chamaecyparis obtusa</i>	1.00%	48.30%	-3.70907	-32.3136
294	Rural	Vascular plants	Vascular plants	<i>Chamaecyparis obtusa</i>	1.30%	46.00%	-3.63996	-31.8596

295	Rural	Vascular plants	Vascular plants	<i>Chamaecyparis obtusa</i>	0.90%	48.10%	-2.65426	-29.1806
296	Rural	Vascular plants	Vascular plants	<i>Taraxacum officinale</i>	3.30%	37.40%	3.03639	-31.0726
297	Rural	Vascular plants	Vascular plants	<i>Taraxacum officinale</i>	2.60%	36.60%	2.404321	-31.2676
298	Rural	Vascular plants	Vascular plants	<i>Taraxacum officinale</i>	2.80%	38.10%	1.938907	-31.9996
299	Rural	Vascular plants	Vascular plants	<i>Pueraria lobata</i>	3.50%	42.40%	-0.85663	-30.3776
300	Rural	Vascular plants	Vascular plants	<i>Pueraria lobata</i>	3.00%	43.10%	-1.08425	-29.5736
301	Rural	Vascular plants	Vascular plants	<i>Pueraria lobata</i>	3.00%	41.40%	-1.81083	-30.3476

1) Urban and Rural indicate Site A and Site I, respectively, in Figure 1.

Supplementary Material 3. Numbers of terrestrial gastropods collected during the field survey in Ibaraki Prefecture, Japan. Letters A to U represent the Site IDs described in Figure 1 and Supplementary Material 1.

Site		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	Total
Family	Species																						
Achatinidae	<i>Allopeas clavulinum</i>	2	1	0	0	1	9	5	9	3	6	6	2	3	0	0	0	0	4	4	0	10	65
Achatinidae	<i>Opeas striatissum</i>	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Achatinidae	<i>Paropeas achatinaceum</i>	0	0	15	0	0	0	0	0	0	0	2	0	0	4	1	1	0	0	0	0	0	23
Discidae	<i>Discus pauper</i>	0	0	7	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	9
Succineida	<i>Succinea lauta</i>	0	0	0	0	0	0	0	0	17	0	0	0	0	0	0	0	0	0	0	0	0	17
Philomycida	<i>Meghimatium bilineatum</i>	1	0	1	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	6
Philomycida	<i>Meghimatium fruhstorferi</i>	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Limacida	<i>Limax maximus</i>	4	1	0	0	0	7	2	1	8	1	0	1	0	0	0	0	0	0	0	1	1	27
Limacida	<i>Ambigolimax valentianus</i>	2	0	0	6	0	2	0	6	0	0	0	0	0	2	0	1	0	0	0	0	3	22
Gastrodontida	<i>Zonitoides arboreus</i>	1	4	1	3	0	2	2	0	0	1	0	0	0	2	1	0	0	0	0	0	10	27
Euconulida	<i>Parasitala reinhardti</i>	3	4	4	0	8	3	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	26

Helicarionida	<i>Yamatochlamys lampra</i>	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Camaenida	<i>Satsuma japonica</i>	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	2	4
Camaenida	<i>Aegista tokyoensis</i>	2	0	0	0	0	0	0	0	1	0	2	0	2	0	0	0	0	4	2	0	13
Camaenida	<i>Bradybaena pellucida</i>	0	0	0	0	0	11	16	5	16	12	30	12	4	0	0	0	17	0	0	0	123
Camaenida	<i>Acusta sieboldtiana</i>	15	6	10	15	0	13	3	10	2	2	0	2	20	3	0	5	2	7	11	0	142
Camaenida	<i>Euhadra brandtii</i>	0	0	1	8	0	0	6	0	0	0	0	4	8	0	0	2	11	0	3	0	43
Camaenida	<i>Euhadra quaesita</i>	1	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	4
Clausiliidae	<i>Euphaedusa digonoptyx</i>	0	0	0	0	0	0	0	5	0	0	7	0	0	0	0	0	0	0	0	0	12
Clausiliidae	<i>Zaptyx buschii</i>	0	0	0	0	0	0	1	0	0	0	9	0	0	0	0	0	0	1	0	0	11
Total		32	16	39	33	11	48	35	38	49	22	60	21	40	11	3	10	30	12	22	6	578