

Electronic Supplementary Material

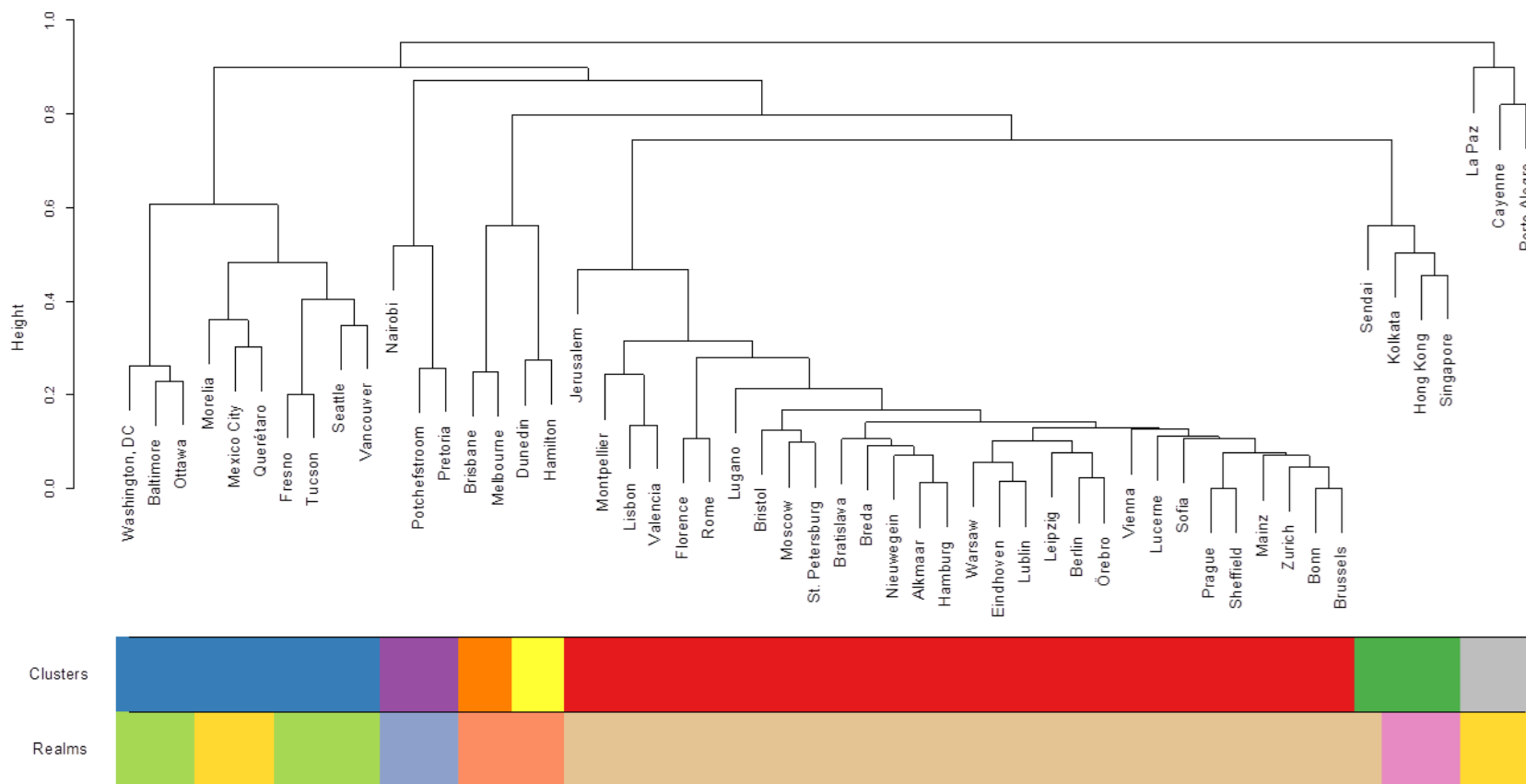


Fig. S1. Dendrogram of the compositional associations in bird assemblages among 54 cities. The primary clusters were identified using an adaptive branch pruning technique with a minimum cluster size of one (see *Methods* for details). Realms represent the biogeographical realm where each city is located (see Fig. 1): Nearctic (green), Palearctic (brown), Neotropics (yellow), Afrotropics (blue), Indo Malaya (violet), and Australasia (orange).

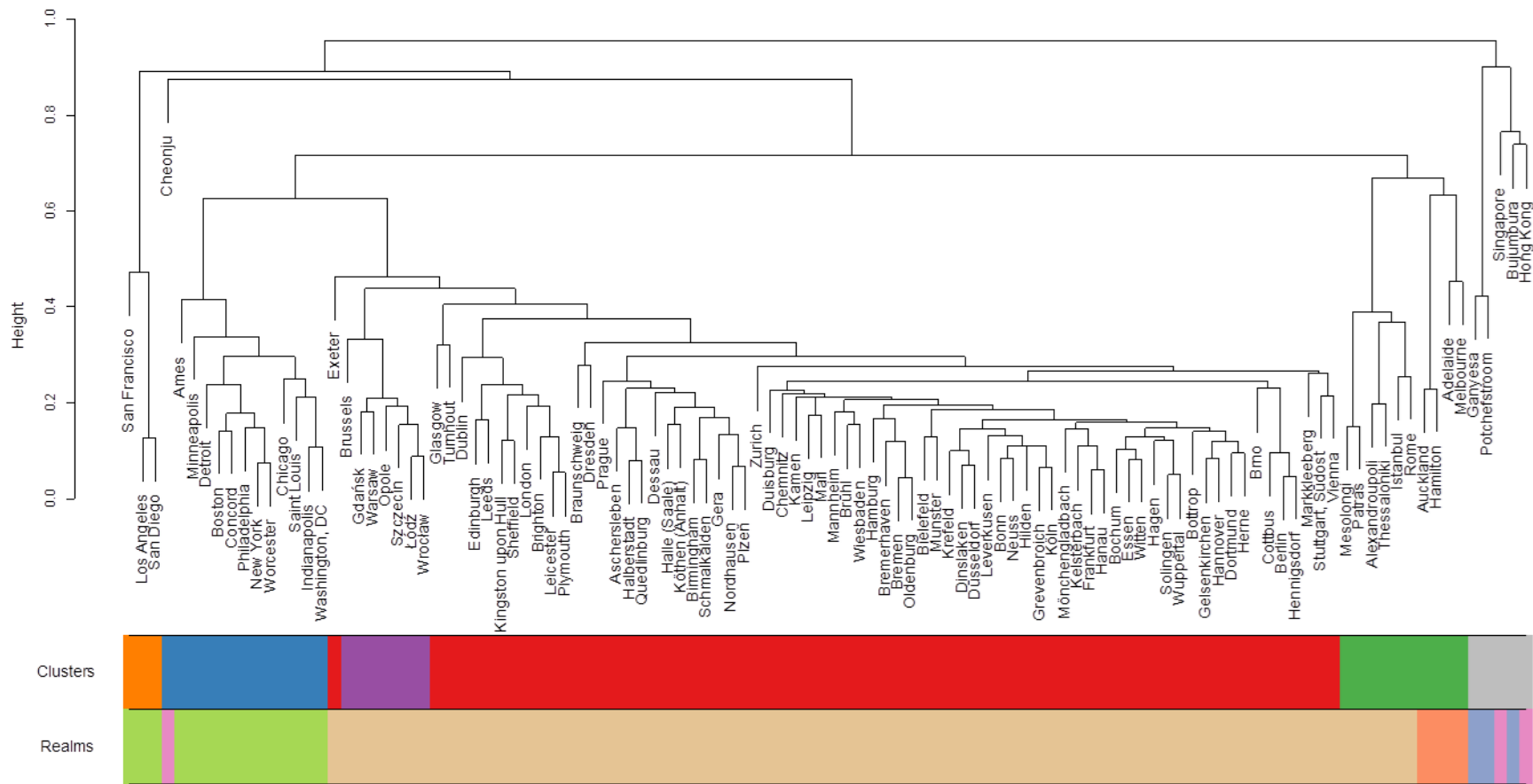


Fig. S2. Dendrogram of the compositional associations in plant assemblages among 110 cities. The primary clusters were identified using an adaptive branch pruning technique with a minimum cluster size of one (see *Methods* for details). Realms represent the biogeographical realm where each city is located (see Fig. 1): Nearctic (green), Palearctic (brown), Afrotropics (blue), Indo Malaya (violet), and Australasia (orange).

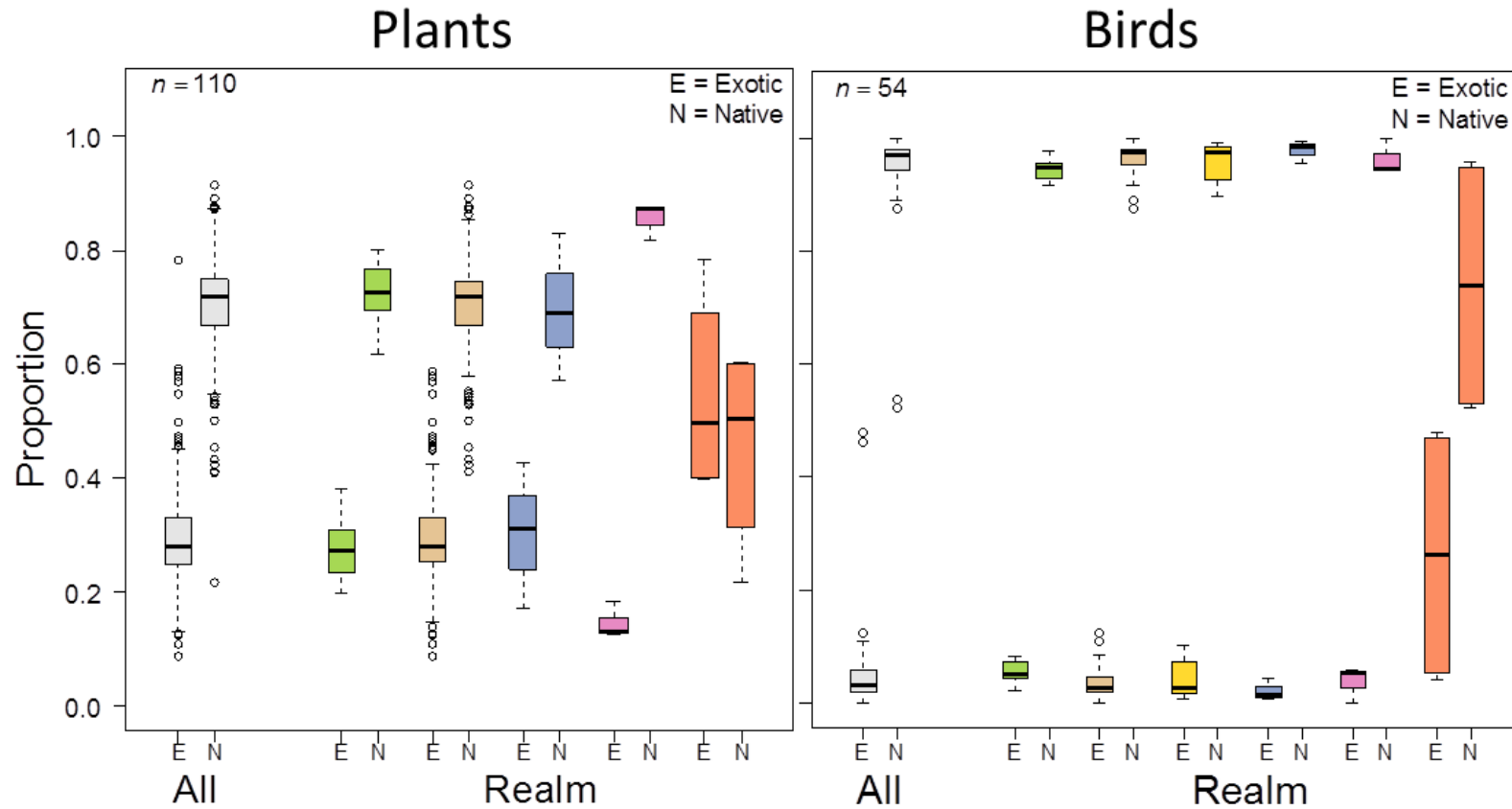


Fig. S3. The proportion of native (N) and exotic (E) species of plant and birds in cities. The box plots show proportions for all cities combined (All) and for cities in six biogeographical realms. The realms are identified by color (see Fig. 1) and include the Nearctic (green), Palearctic (brown), Neotropics (yellow), Afrotropics (blue), Indo Malaya (violet), and Australasia (orange). No cities in the Neotropics contain plant data.

Table S1. The 54 cities used in the bird analysis with the total number of species, the number of exotic species, number of native species, and the data source.

city	country	total	exotic	native	source
Alkmaar	Netherlands	77	4	73	1
Baltimore	USA	82	5	77	2
Berlin	Germany	153	5	148	3-4
Bonn	Germany	190	16	174	5
Bratislava	Slovakia	215	2	213	6
Breda	Netherlands	82	4	78	7
Brisbane	Australia	119	5	114	8
Bristol	UK	71	4	67	9
Brussels	Belgium	97	0	97	10
Cayenne	French Guyana	135	1	134	11
Dunedin	New Zealand	39	18	21	12
Eindhoven	Netherlands	68	2	66	13
Florence	Italy	82	2	80	14
Fresno	USA	73	6	67	15
Hamburg	Germany	158	6	152	4, 16
Hamilton	New Zealand	46	22	24	17
Hong Kong	China	111	6	105	18
Jerusalem	Israel	24	3	21	19-20
Kolkata	India	269	0	269	21
La Paz	Bolivia	64	1	63	22
Leipzig	Germany	114	3	111	23
Lisbon	Portugal	94	1	93	24
Lublin	Poland	204	3	201	25
Lucerne	Switzerland	51	1	50	26
Lugano	Switzerland	40	1	39	26
Mainz	Germany	122	3	119	27
Melbourne	Australia	272	17	255	28
Mexico City	Mexico	190	14	176	29
Montpellier	France	65	1	64	30
Morelia	Mexico	138	4	134	31
Moscow	Russia	161	3	158	32
Nairobi	Kenya	304	2	302	33
Nieuwegein	Netherlands	70	4	66	34
Örebro	Sweden	44	1	43	35
Ottawa	Canada	135	3	132	36
Porto Alegre	Brazil	132	3	129	37
Potchefstroom	South Africa	211	3	208	38
Prague	Czech Republic	235	6	229	39
Pretoria	South Africa	92	4	88	40

city	country	total	exotic	native	source
Querétaro	Mexico	98	10	88	41
Rome	Italy	115	9	106	42
Seattle	USA	42	2	40	43
Sendai	Japan	31	1	30	44
Sheffield	UK	68	3	65	45
Singapore	Singapore	368	21	347	46
Sofia	Bulgaria	210	5	205	47
St. Petersburg	Russia	213	1	212	48
Tucson	USA	174	7	167	49
Valencia	Spain	211	23	188	50
Vancouver	Canada	48	4	44	51
Vienna	Austria	137	4	133	52
Warsaw	Poland	130	1	129	4, 53
Washington, DC	USA	79	4	75	54
Zurich	Switzerland	42	1	41	26

Table S2. The 110 cities used in the plant analysis with the total number of species, the number of exotic species, number of native species, and the data source.

city	country	total	exotic	native	source
Adelaide	Australia	1588	633	955	55
Alexandroupoli	Greece	439	38	401	56
Ames	USA	391	124	267	57
Aschersleben	Germany	620	176	444	58
Auckland	New Zealand	1350	1058	292	59-60
Berlin	Germany	947	245	702	61
Bielefeld	Germany	767	168	599	61
Birmingham	UK	861	429	432	62
Bochum	Germany	677	177	500	63
Bonn	Germany	895	247	648	61
Boston	USA	2302	720	1582	64
Bottrop	Germany	647	166	481	61
Braunschweig	Germany	643	153	490	61
Bremen	Germany	989	279	710	61
Bremerhaven	Germany	690	174	516	61, 65
Brighton	UK	566	164	402	66
Brno	Czech Republic	965	440	525	67
Brühl	Germany	654	177	477	61
Brussels	Belgium	759	446	313	68
Bujumbura	Burundi	397	170	227	69
Chemnitz	Germany	779	217	562	61, 70
Cheonju	South Korea	454	83	371	71
Chicago	USA	1496	452	1044	64
Concord	USA	584	160	424	72
Cottbus	Germany	550	110	440	61
Dessau	Germany	859	214	645	73-74
Detroit	USA	1612	411	1201	64
Dinslaken	Germany	650	198	452	61
Dortmund	Germany	710	186	524	61
Dresden	Germany	681	201	480	61
Dublin	Ireland	534	181	353	75
Duisburg	Germany	691	229	462	61
Düsseldorf	Germany	832	263	569	61
Edinburgh	UK	312	104	208	76
Essen	Germany	562	145	417	61, 77
Exeter	UK	329	180	149	78
Frankfurt	Germany	1012	283	729	61, 79

city	country	total	exotic	native	source
Ganyesa	South Africa	269	46	223	80-81
Gdańsk	Poland	971	439	532	82
Gelsenkirchen	Germany	603	157	446	61
Gera	Germany	953	254	699	83
Glasgow	UK	978	327	651	84
Grevenbroich	Germany	575	144	431	61
Hagen	Germany	674	135	539	61
Halberstadt	Germany	733	212	521	58
Halle (Saale)	Germany	892	332	560	61, 85
Hamburg	Germany	815	199	616	61
Hamilton	New Zealand	490	290	200	86-91
Hanau	Germany	814	207	607	61, 92
Hannover	Germany	954	268	686	61
Hennigsdorf	Germany	735	155	580	61
Herne	Germany	627	156	471	61
Hilden	Germany	785	217	568	61
Hong Kong	China	1883	243	1640	93
Indianapolis	USA	693	187	506	94
Istanbul	Turkey	311	43	268	95
Kamen	Germany	655	167	488	61
Kelsterbach	Germany	802	210	592	61
Kingston upon Hull	UK	484	142	342	96
Köln	Germany	965	284	681	61, 65
Köthen (Anhalt)	Germany	562	233	329	58
Krefeld	Germany	752	229	523	61
Leeds	UK	699	269	430	97
Leicester	UK	417	114	303	98
Leipzig	Germany	857	293	564	61
Leverkusen	Germany	712	221	491	61
Łódź	Poland	538	252	286	82
London	UK	566	187	379	99
Los Angeles	USA	865	193	672	100-101
Mannheim	Germany	860	268	592	62, 102
Markkleeberg	Germany	775	234	541	61
Marl	Germany	770	203	567	61
Melbourne	Australia	1655	666	989	103-104
Mesolongi	Greece	336	43	293	105
Minneapolis	USA	1391	281	1110	64
Mönchengladbach	Germany	614	152	462	61
Munster	Germany	525	133	392	61
Neuss	Germany	659	184	475	61
New York	USA	2280	719	1561	64

city	country	total	exotic	native	source
Nordhausen	Germany	381	161	220	106
Oldenburg	Germany	698	188	510	61
Opole	Poland	779	356	423	82
Patras	Greece	765	98	667	107-108
Philadelphia	USA	2528	762	1766	64
Plymouth	UK	1138	510	628	109
Plzeň	Czech Republic	1705	985	720	110-111
Potchefstroom	South Africa	576	179	397	112-119
Prague	Czech Republic	1019	329	690	120
Quedlinburg	Germany	952	269	683	58
Rome	Italy	1259	224	1035	121
Saint Louis	USA	1745	423	1322	65
San Diego	USA	893	186	707	101, 122
San Francisco	USA	878	174	704	101, 123
Schmalkalden	Germany	331	93	238	124
Sheffield	UK	743	246	497	125
Singapore	Singapore	1787	225	1562	126
Solingen	Germany	701	183	518	61
Stuttgart, Südost	Germany	813	231	582	61
Szczecin	Poland	840	390	450	82
Thessaloniki	Greece	963	142	821	127-128
Turnhout	Belgium	453	49	404	129
Vienna	Austria	1409	175	1234	130
Warsaw	Poland	592	244	348	82
Washington, DC	USA	2396	690	1706	64
Wiesbaden	Germany	910	250	660	61, 131
Witten	Germany	743	179	564	61
Worcester	USA	1320	504	816	132
Wrocław	Poland	1135	645	490	82
Wuppertal	Germany	855	224	631	61, 133-134
Zürich	Switzerland	1353	638	715	135

Table S3. Threatened bird and plant species as assessed by the IUCN found in cities worldwide.

city	family	species	status
BIRDS			
Bratislava	Anatidae	<i>Anser erythropus</i>	VU
Bratislava	Otididae	<i>Otis tarda</i>	VU
Cayenne	Fringillidae	<i>Carduelis cucullata</i>	EN
Hamilton	Podicipedidae	<i>Poliiocephalus rufopectus</i>	VU
Kolkata	Accipitridae	<i>Aquila hastata</i>	VU
Kolkata	Accipitridae	<i>Gyps bengalensis</i>	CR
Kolkata	Ploceidae	<i>Ploceus megarhynchus</i>	VU
Melbourne	Ardeidae	<i>Botaurus poiciloptilus</i>	EN
Melbourne	Scolopacidae	<i>Calidris tenuirostris</i>	VU
Melbourne	Psittacidae	<i>Lathamus discolor</i>	EN
Melbourne	Psittacidae	<i>Neophema chrysogaster</i>	CR
Melbourne	Laridae	<i>Sterna nereis</i>	VU
Mexico City	Motacillidae	<i>Anthus spragueii</i>	VU
Nairobi	Gruidae	<i>Balearica regulorum</i>	VU
Nairobi	Accipitridae	<i>Sagittarius serpentarius</i>	VU
Nairobi	Accipitridae	<i>Torgos tracheliotos</i>	VU
Prague	Accipitridae	<i>Aquila clanga</i>	VU
Prague	Accipitridae	<i>Aquila heliaca</i>	VU
Querétaro	Psittacidae	<i>Amazona viridigenalis</i>	EN
Singapore	Accipitridae	<i>Aquila clanga</i>	VU
Singapore	Scolopacidae	<i>Calidris tenuirostris</i>	VU
Singapore	Ardeidae	<i>Egretta eulophotes</i>	VU
Singapore	Emberizidae	<i>Emberiza aureola</i>	VU
Singapore	Scolopacidae	<i>Eurynorhynchus pygmeus</i>	CR
Singapore	Fregatidae	<i>Fregata andrewsi</i>	CR
Singapore	Ciconiidae	<i>Leptoptilos javanicus</i>	VU
Singapore	Picidae	<i>Mulleripicus pulverulentus</i>	VU
Singapore	Scolopacidae	<i>Numenius madagascariensis</i>	VU
Singapore	Pycnonotidae	<i>Pycnonotus zeylanicus</i>	VU
Singapore	Muscicapidae	<i>Rhinomyias brunneatus</i>	VU
Singapore	Scolopacidae	<i>Tringa guttifer</i>	EN
Sofia	Falconidae	<i>Falco cherrug</i>	VU
St. Petersburg	Anatidae	<i>Anser erythropus</i>	VU
St. Petersburg	Emberizidae	<i>Emberiza aureola</i>	VU
Valencia	Procellariidae	<i>Puffinus mauretanicus</i>	CR
Vienna	Falconidae	<i>Falco cherrug</i>	VU
PLANTS			
Hong Kong	Aristolochiaceae	<i>Aristolochia thwaitesii</i>	VU
Hong Kong	Aristolochiaceae	<i>Aristolochia westlandii</i>	CR
Hong Kong	Moraceae	<i>Artocarpus hypargyreus</i>	VU

city	family	species	status
Hong Kong	Theaceae	<i>Camellia crapnelliana</i>	VU
Hong Kong	Rubiaceae	<i>Canthium dicoccum</i>	VU
Hong Kong	Fagaceae	<i>Castanopsis concinna</i>	VU
Hong Kong	Fabaceae	<i>Dalbergia balansae</i>	VU
Hong Kong	Ebenaceae	<i>Diospyros vaccinioides</i>	CR
Hong Kong	Hydrocharitaceae	<i>Halophila beccarii</i>	VU
Hong Kong	Aquifoliaceae	<i>Ilex graciliflora</i>	EN
Hong Kong	Ixonanthaceae	<i>Ixonanthes chinensis</i>	VU
Hong Kong	Hamamelidaceae	<i>Loropetalum subcordatum</i>	VU
Hong Kong	Berberidaceae	<i>Mahonia oiwakensis</i>	VU
Kingston upon Hull	Polygonaceae	<i>Rumex rupestris</i>	VU
Los Angeles	Juglandaceae	<i>Juglans californica</i>	VU
Los Angeles	Fagaceae	<i>Quercus engelmannii</i>	VU
Minneapolis	Orchidaceae	<i>Platanthera praeclara</i>	EN
Rome	Anacardiaceae	<i>Rhus coriaria</i>	VU
San Diego	Juglandaceae	<i>Juglans californica</i>	VU
San Diego	Pinaceae	<i>Pinus torreyana</i>	VU
San Diego	Fagaceae	<i>Quercus dumosa</i>	EN
San Diego	Fagaceae	<i>Quercus engelmannii</i>	VU
San Francisco	Taxodiaceae	<i>Sequoia sempervirens</i>	VU
Singapore	Dipterocarpaceae	<i>Anisoptera laevis</i>	EN
Singapore	Dipterocarpaceae	<i>Anisoptera megistocarpa</i>	CR
Singapore	Thymelaceaceae	<i>Aquilaria malaccensis</i>	VU
Singapore	Thymelaceaceae	<i>Aquilaria microcarpa</i>	VU
Singapore	Rhizophoraceae	<i>Bruguiera hainesii</i>	CR
Singapore	Fagaceae	<i>Castanopsis nephelioides</i>	VU
Singapore	Fagaceae	<i>Castanopsis wallichii</i>	VU
Singapore	Dipterocarpaceae	<i>Cotylelobium lanceolatum</i>	VU
Singapore	Dipterocarpaceae	<i>Dipterocarpus cornutus</i>	CR
Singapore	Dipterocarpaceae	<i>Dipterocarpus elongatus</i>	CR
Singapore	Dipterocarpaceae	<i>Dipterocarpus grandiflorus</i>	CR
Singapore	Dipterocarpaceae	<i>Dipterocarpus kunstleri</i>	CR
Singapore	Dipterocarpaceae	<i>Dipterocarpus sublamellatus</i>	EN
Singapore	Dipterocarpaceae	<i>Dipterocarpus tempehes</i>	CR
Singapore	Elaeocarpaceae	<i>Elaeocarpus acmosepalus</i>	VU
Singapore	Elaeocarpaceae	<i>Elaeocarpus rugosus</i>	VU
Singapore	Theaceae	<i>Gordonia multinervis</i>	VU
Singapore	Theaceae	<i>Gordonia penangensis</i>	VU
Singapore	Theaceae	<i>Gordonia singaporeana</i>	VU
Singapore	Hydrocharitaceae	<i>Halophila beccarii</i>	CU
Singapore	Dipterocarpaceae	<i>Hopea griffithii</i>	CU
Singapore	Dipterocarpaceae	<i>Hopea sangal</i>	CR
Singapore	Aquifoliaceae	<i>Ilex maingayi</i>	VU
Singapore	Fabaceae	<i>Intsia bijuga</i>	CU
Singapore	Myristicaceae	<i>Knema communis</i>	CU

city	family	species	status
Singapore	Rubiaceae	<i>Lasianthus tomentosus</i>	EN
Singapore	Anacardiaceae	<i>Mangifera macrocarpa</i>	VU
Singapore	Melastomataceae	<i>Memecylon floridum</i>	VU
Singapore	Sapindaceae	<i>Nephelium costatum</i>	VU
Singapore	Dipterocarpaceae	<i>Shorea bracteolata</i>	VU
Singapore	Dipterocarpaceae	<i>Shorea gibbosa</i>	VU
Singapore	Dipterocarpaceae	<i>Shorea gratissima</i>	CR
Singapore	Dipterocarpaceae	<i>Shorea leprosula</i>	VU
Singapore	Dipterocarpaceae	<i>Shorea ochrophloia</i>	CR
Singapore	Dipterocarpaceae	<i>Shorea pauciflora</i>	EN
Singapore	Dipterocarpaceae	<i>Shorea platycarpa</i>	CR
Singapore	Pentaphylacaceae	<i>Ternstroemia corneri</i>	VU
Singapore	Pentaphylacaceae	<i>Ternstroemia penangiana</i>	VU
Singapore	Dipterocarpaceae	<i>Vatica maingayi</i>	CR
Singapore	Dipterocarpaceae	<i>Vatica pauciflora</i>	EN
Singapore	Dipterocarpaceae	<i>Vatica ridleyana</i>	CR
Thessaloniki	Rosaceae	<i>Pyrus korshinskyi</i>	CR

Status: CR=critically endangered, EN=endangered, VU=vulnerable.

Table S4. Robust regression coefficients, standard error, and test statistics for 10 variables modeling bird and plant species density in cities worldwide.

model	predictors	bird density			plant density			native plant density		
		coef.	SE	<i>F</i>	coef.	SE	<i>F</i>	coef.	SE	<i>F</i>
<u>anthropogenic</u>										
land cover	Urban extent	-2.139	0.666	10.64**	-0.526	0.333	2.30	-0.395	0.345	1.28
	% Intact veg.	0.814	0.606	1.78	1.292	0.357	13.08***	1.346	0.364	13.91***
city age	Estab. date	-1.537	0.151	1.33	2.751	0.673	15.39***	2.837	0.683	16.85***
<u>non-anthropogenic</u>										
geography	Latitude	-0.033	0.228	0.02	0.174	0.198	0.84	0.14	0.204	0.53
climate	Temp.	0.003	0.032	0.01	-0.063	0.027	5.13*	-0.051	0.028	3.31
	Temp. seasonality	-0.008	0.008	1.08	0.008	0.005	2.24	0.008	0.005	2.25
	Precip.	0.000	0.000	1.59	0.000	0.000	0.16	0.000	0.000	0.51
	Precip. seasonality	-0.005	0.006	0.72	-0.014	0.005	9.32**	-0.014	0.005	9.25**
topography	Elev.	-0.162	0.086	3.63	0.034	0.084	0.16	0.013	0.087	0.02
	Elev. variation	-0.169	0.145	1.38	-0.086	0.095	0.81	-0.099	0.098	1.05

Significant differences for robust *F*-tests are indicated: $P < 0.1$, $*P < 0.05$, $**P < 0.01$, and $***P < 0.001$.

Table S5. Robust regression coefficients, standard error, and test statistics for 10 variables modeling the proportion of non-urban bird and plant species density retained in cities worldwide.

model	predictors	bird density			plant density			native plant density		
		coef.	SE	<i>F</i>	coef.	SE	<i>F</i>	coef.	SE	<i>F</i>
<u>anthropogenic</u>										
land cover	Urban extent	-2.374	0.684	12.58***	-0.522	0.350	2.12	-0.400	0.355	1.21
	% Intact veg.	0.749	0.632	1.40	1.438	0.367	15.59***	1.506	0.369	16.91***
City age	Estab. date	-2.085	0.157	2.28	2.884	0.706	15.13***	2.951	0.710	16.04***
<u>non-anthropogenic</u>										
geography	Latitude	0.263	0.234	1.31	0.416	0.202	4.62*	0.387	0.204	3.92
	climate	Temp.	-0.023	0.034	0.44	-0.100	0.028	13.04***	-0.089	0.028
Temp. seasonality		-0.002	0.008	0.08	0.008	0.005	2.26	0.008	0.005	2.42
Precip.		0.000	0.000	0.17	0.000	0.000	0.05	0.000	0.000	0.00
Precip. seasonality		-0.009	0.007	2.06	-0.019	0.005	17.09***	-0.020	0.005	18.44***
topography		Elev.	-0.200	0.089	5.17*	-0.029	0.088	0.11	-0.053	0.089
	Elev. variation	-0.181	0.151	1.45	-0.146	0.099	2.17	-0.165	0.100	2.76

Significant differences for robust *F*-tests are indicated: $P < 0.1$, * $P < 0.05$, ** $P < 0.01$, and *** $P < 0.001$.

Table S6. Description and sources for the 15 variables considered in our analysis.

variable	description	source
area	Surface area of the city (km ²).	92, 95, 136-141
urban extent	Percent urban landcover within a 15 km radius of the city center (resolution: 500 m).	MODIS 500-m map of global urban extent ¹⁴²
% intact veg.	Percent intact vegetation (grassland, shrubland, forest) within a 15 km radius of the city center (resolution: 300 m; classes: 30, 40, 50, 60, 70, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180).	GLOBCOVER ¹⁴³ (version 2.3)
% cropland	Percent cropland vegetation within a 15 km radius of the city center (resolution: 300 m; classes: 11, 14, 20).	GLOBCOVER ¹⁴³ (version 2.3)
dist. to coast	The minimum distance (km) from the edge of a city to the oceanic coast. For cities on bays, the distance is zero. Freshwater lakes (e.g., Great Lakes) are not included.	
estab. date	Establishment date or the year the city was founded.	137
realm	The biogeographic realm where the city was located.	
latitude	The latitude of the city center.	
elev.	The average elevation (m) within a 15 km radius of the city center (resolution: 30 arc seconds).	SRTM ¹⁴⁴ (version 4)
elev. variation	The variation (SD) or topographic heterogeneity of elevation within a 15 km radius of the city center (resolution: 30 arc seconds).	SRTM ¹⁴⁴ (version 4)
tmp	Annual mean temperature (°C; resolution: 10 arc minutes).	BIOCLIM (BIO1) ¹⁴⁵
tmp.sd	Temperature seasonality (SD; resolution: 10 arc minutes).	BIOCLIM (BIO4) ¹⁴⁵
pre	Annual precipitation (mm; resolution: 10 arc minutes).	BIOCLIM (BIO12) ¹⁴⁵
pre.sd	Annual precipitation seasonality (CV; resolution: 10 arc minutes).	BIOCLIM (BIO15) ¹⁴⁵

References

1. Smit H, Roobeek CF, Damm T. 2005 *De Broedvogels van Alkmaar in 2001-2004*. Heerhugowaard: Vogelwerkgroep Alkmaar e.o.
2. Denison CB. 2010 *Effects of socioeconomics on European Starling (Sturnus vulgaris) abundance in Baltimore, Maryland*. MS Thesis, University of Missouri, Columbia.
3. Witt K. 2005. Berlin. In *Birds in European Cities* (eds Kelcey JG, Rheinwald G), pp 17-39. St. Katharinen: Ginster Verlag.
4. Witt K, Mitschke A, Luniak M. 2005 A comparison of common breeding bird populations in Hamburg, Berlin and Warsaw. *Acta Ornithol.* **40**,139-146.
5. Rheinwald G. 2005 Bonn. In *Birds in European Cities* (eds Kelcey JG, Rheinwald G), pp 41-54. St. Katharinen: Ginster Verlag.
6. Feriancova-Masarova Z, Kalivodova E. 2005 Bratislava. In *Birds in European Cities* (eds Kelcey JG, Rheinwald G), pp 55-79. St. Katharinen: Ginster Verlag.
7. Van Iersel P, Van Iersel P, Van Der Sanden A. 2009 *Vogels Houden van Breda*. Breda: NPN Media B.V.
8. Sushinsky JR. 2011 *Urban growth, biodiversity, and the extinction of experience*. M.Phil. Thesis, University of Queensland.
9. Baker PJ, Thomas RL, Newson SE, Thompson V, Paling, NR. 2010 Habitat associations and breeding bird community composition within the city of Bristol, UK. *Bird Study* **57**, 183-196.
10. Weiserbs A, Jacob JP. 2005 Brussels. In *Birds in European Cities* (eds Kelcey JG, Rheinwald G), pp 81-101. St. Katharinen: Ginster Verlag.
11. Reynaud PA, Thioulouse J. 2000 Identification of birds as biological markers along a neotropical urban-rural gradient (Cayenne, French Guiana), using co-inertia analysis. *J. Environ. Manage.* **59**, 121-140.
12. van Heezik Y, Smyth A, Mathieu R. 2008 Diversity of native and exotic birds across an urban gradient in a New Zealand city. *Landscape Urban Plan.* **87**, 223-232.
13. Marechal P, Veenhuizen, W. 1997 *Vogels in het Stedelijke Milieu: Inventarisatie in Eindhoven*. Utrecht: Wetensch Med. KNNV.
14. Dinetti M. 2005 Florence. In *Birds in European Cities* (eds Kelcey JG, Rheinwald G), pp 103-105. St. Katharinen: Ginster Verlag.
15. Schleder BW. 2010 *Residential irrigation as a driver of urban bird communities*. MS Thesis, California State University, Fresno.
16. Mulsow R. 2005 Hamburg. In *Birds in European Cities* (eds Kelcey JG, Rheinwald G), pp 127-151. St. Katharinen: Ginster Verlag.
17. Innes J, Fitzgerald N, Thornburrow D, Burns B. 2008 *Second biennial bird counts in Hamilton City, 2006*. Hamilton: Landcare Research.
18. Lock NY, 駱雅儀. 2000 *The ecology of urban birds in Hong Kong*. PhD Thesis, University of Hong Kong.
19. Bino G, et al. 2008 Accurate prediction of bird species richness patterns in an urban environment using Landsat-derived NDVI and spectral unmixing. *Int. J. Remote Sens.* **29**, 3675-3700.

20. JBO. 2008 *The JBO's bird list*. JBO. See http://www.jbo.org.il/English/jbo_about_us.htm.
21. Sen SK. 2011 *Birds of India: Checklist of Birds of Kolkata*. See <http://www.kolkatabirds.com/list.htm>.
22. Villegas M, Garitano-Zavala Á. 2010 Bird community responses to different urban conditions in La Paz, Bolivia. *Urban Ecosyst.* **13**, 375-391.
23. Strohbach MW, Haase D, Kabisch N (2009) Birds and the city: urban biodiversity, land Use, and socioeconomics. *Ecol. Soc.* **14**, 31.
24. Geraldes P, Costa H. 2005 Lisbon. In *Birds in European Cities* (eds Kelcey JG, Rheinwald G), pp 153-170. St. Katharinen: Ginster Verlag.
25. Biadun W. 2005 Lublin. In *Birds in European Cities* (eds Kelcey JG, Rheinwald G), pp 171-196. St. Katharinen: Ginster Verlag.
26. Sattler T, *et al.* 2010 Spider, bee, and bird communities in cities are shaped by environmental control and high stochasticity. *Ecology* **91**, 3343-3353.
27. Jäckel U. 2002 Beitrag zur afivauna des Mainzer Stadtgebietes. *Mainzer Naturwissenschaftliches Archiv* **22**, 240-247.
28. Birds Australia. 2009 Birdata. See <http://www.birdata.com.au/homecontent.do>.
29. Ortega-Álvarez R, MacGregor-Fors I. 2009 Living in the big city: Effects of urban land-use on bird community structure, diversity, and composition. *Landscape Urban Plan* **90**, 189-195.
30. Caula S, Marty P, Martin J-L. 2008 Seasonal variation in species composition of an urban bird community in Mediterranean France. *Landscape Urban Plan* **87**, 1-9.
31. López-López S. 2011 *Efectos de la urbanización sobre las comunidades de aves y lepidópteros de la ciudad de Morelia*. Bsc Thesis, UMSNH, Morelia.
32. Konstantinov VM, Zakharov R. 2005 Moscow. In *Birds in European Cities* (eds Kelcey JG, Rheinwald G), pp 197-214. St. Katharinen: Ginster Verlag.
33. Njoroge JB, Nda'nganga PK. 2010 Seasonal characteristics of avifauna in Nairobi metropolitan landscape. *Proceedings of 2010 JKUAT scientific technological and industrialization conference, Nairobi*: 31-41.
34. Abel G, *et al.* 2009 *Broedvogels in Nieuwegein: Waar, hoeveel en trends*. Utrecht: Vogelwacht Utrecht.
35. Sandström UG, Angelstam P, Mikusinski G. 2006 Ecological diversity of birds in relation to the structure of urban green space. *Landscape Urban Plan* **77**, 39-53.
36. Ottawa Breeding Bird Count. 2011 Ottawa Breeding Bird Count. See <http://www.glel.carleton.ca/ottawabirds/>.
37. Fontana CS, Burger MI, Magnusson WE. 2011 Bird diversity in a subtropical South-American City: effects of noise levels, arborisation and human population density. *Urban Ecosyst* **14**, 341-360.
38. Smith NC. 2004 *Birds and the urban ecology of Potchefstroom*. MS Thesis, North-West University, Potchefstroom.
39. Stastny K, Bejcek V, Kelcey JG. 2005 Prague. In *Birds in European Cities* (eds Kelcey JG, Rheinwald G), pp 215-241. St. Katharinen: Ginster Verlag.
40. van Rensburg BJ, Peacock DS, Robertson MP. 2009 Biotic homogenization and alien bird species along an urban gradient in South Africa. *Landscape Urban Plan* **92**, 233-241.

41. Pineda-López R. 2011 *Factores que determinan la riqueza de la avifauna de la zona urbana y periurbana de la ciudad de Querétaro*. Informe Final del Proyecto FNB-2008-05. Universidad Autónoma de Querétaro, Querétaro.
42. Cignini B, Zapparoli M. 2005 Rome. In *Birds in European Cities* (eds Kelcey JG, Rheinwald G), pp 243-277. St. Katharinen: Ginster Verlag.
43. Donnelly R, Marzluff JM. 2006 Relative importance of habitat quantity, structure, and spatial pattern to birds in urbanizing environments. *Urban Ecosyst* **9**, 99-117.
44. Imai H, Nakashizuka T. 2010 Environmental factors affecting the composition and diversity of avian community in mid- to late breeding season in urban parks and green spaces. *Landscape Urban Plan.* **96**, 183-194.
45. Fuller RA, Tratalos J, Gaston KJ. 2009 How many birds are there in a city of half a million people? *Divers. Distrib.* **15**, 328-337.
46. Wang LK, Hails CJ. 2007 An annotated checklist of birds of Singapore. *Raffles B. Zool., Suppl* **15**, 1-189.
47. Iankov P. 2005 Sofia. In *Birds in European Cities* (eds Kelcey JG, Rheinwald G), pp 279-305. St. Katharinen: Ginster Verlag.
48. Khrabryi V. 2005 St. Petersburg. In *Birds in European Cities* (eds Kelcey JG, Rheinwald G), pp 307-333. St. Katharinen: Ginster Verlag.
49. McCaffrey RE. 2005 Using citizen science in urban bird studies. *Urban Habitats* **3**, 70-86.
50. Murgui E. 2005 Valencia. In *Birds in European Cities* (eds Kelcey JG, Rheinwald G), pp 335-358. St. Katharinen: Ginster Verlag.
51. Melles S, Glenn S, Martin K. 2003 Urban bird diversity and landscape complexity: species-environment associations along a multiscale habitat gradient. *Conserv. Ecol.* **7**, 5.
52. Holzer T, Sziemer P. 2005 Vienna. In *Birds in European Cities* (eds Kelcey JG, Rheinwald G), pp 359-388. St. Katharinen: Ginster Verlag.
53. Luniak M. 2005 Warsaw. In *Birds in European Cities* (eds Kelcey JG, Rheinwald G), pp 389-415. St. Katharinen: Ginster Verlag.
54. Hadidian J, *et al.* 1997 A citywide breeding bird survey for Washington, DC. *Urban Ecosyst* **1**, 87-102.
55. Tait CJ, Daniels CB, Hill RS. 2005 Changes in species assemblages within the Adelaide Metropolitan Area, Australia. *Ecol. Appl.* **15**, 346-359.
56. Chronopoulos G, Christodoulakis D. 2006 Contribution to the Urban ecology of Greece: The flora of Alexandroupolis (NE Greece) and its vicinity. *Fresen. Environ. Bull.* **15**, 1455-1466.
57. Norris WR, Lewis DQ, Widrlechner, MP, Thompson JD, Pope RO. 2001 Lessons from an inventory of the Ames, Iowa, flora (1859-2000). *Journal of the Iowa Academy of Sciences* **108**, 34-63.
58. Benkert D, Fukarek F, Korsch H. 1996 *Verbreitungsatlas der Farn- und Blütenpflanzen Ostdeutschlands*. Jena: Gustav Fischer Verlag.
59. Esler AE. 2001 Changes in the native plant cover of urban Auckland, New Zealand. *New Zeal. J. Bot.* **29**, 177-196.
60. Duncan RP, Young JR. 2000 Determinants of plant extinction and rarity 145 years after European settlement of Auckland, New Zealand. *Ecology* **81**, 3048-3061.
61. Bundesamt für Naturschutz. 2011 *FloraWeb: Daten und Informationen zu Wildpflanzen und zur Vegetation Deutschlands*. See <http://www.floraweb.de/>.

62. Cadbury DA, Hawkes JG, Readett RC. 1971 *A computer-mapped flora: A study of the County of Warwickshire*. Birmingham: Birmingham Natural History Society, Academic Press.
63. Schulte W. 1985 *Florenanalyse und Raumbewertung im Bochumer Stadtbereich*. Bochum: University of Bochum.
64. Clemants S, Moore G. 2003 Patterns of species richness in eight northeastern United States cities. *Urban Habitats* **1**, 4–11.
65. Kunick W. 1983 *Köln. Landschaftsökologische Grundlagen. T3: Biotopkartierung*. Köln: Oberstadtdirektor Grünflächenamt.
66. Hall PC. 1980 *Sussex plant atlas: An atlas of the distribution of wild plants in Sussex compiled from records collected by the Sussex Flora Society 1966-1978*. Brighton: Brighton Borough Council, Booth Museum of Natural History.
67. Grull F. 1974 Prispevek k adventivni kvetene mesta Brna (Beitrag zur Adventivflora der Stadt Brno). *Zpravy. Cesk. Bot. Spol.* **9**, 35–38.
68. Godefroid S. 2001 Temporal analysis of the Brussels flora as indicator for changing environmental quality. *Landscape Urban Plan.* **52**, 203–224.
69. Bigirimana J, Bogaert J, De Canniere C, Lejoly J, Parmentier I. 2011 Alien plant species dominate the vegetation in a city of Sub-Saharan Africa. *Landscape Urban Plan.* **100**, 251-267.
70. Grundmann H. 1992 Die wildwachsenden und verwilderten Gefäßpflanzen der Stadt Chemnitz und ihrer unmittelbaren Umgebung. *Veröff Nat kd mus Chemnitz* **15**, 1-240.
71. Choi I. 2005 *Vorkommen und Verbreitung von Pflanzenarten in der Stadt Cheon-ju (Südkorea) unter besonderer Berücksichtigung anthropogener Einflüsse*. Diss. Fakultät VII - Architektur Umwelt Gesellschaft, Technische Universität Berlin.
72. Primack RB, Miller-Rushing AJ, Dharaneeswaran K. 2009 Changes in the flora of Thoreau's Concord. *Biol. Conserv.* **142**, 500–508.
73. Voigt O. 1982 *Flora von Dessau und Umgebung, 2 Teil*. Dessau: Naturkundliche Beiträge des Museums Dessau.
74. Voigt O. 1980 *Flora von Dessau und Umgebung, 1 Teil*. Dessau: Naturwissenschaftliche Beiträge des Museums Dessau.
75. Jackson PW, Skeffington MS. 1984 *Flora of inner Dublin*. Dublin: Royal Dublin Society.
76. McKean DR. 1989 *A checklist of the flowering plants and ferns of Midlothian*. Edinburgh: Botanical Society of Edinburgh.
77. Reidl K, Dettmar J. 1993 Flora und Vegetation der Städte des Ruhrgebietes, insbesondere der Stadt Essen und der Industrieflächen. *Ber Dt Landeskd* **67**, 299-326.
78. Ivimey-Cook RB. 1984 *Atlas of the Devon flora: flowering plants and ferns*. Devonshire: Devonshire Association for the Advancement of Science.
79. Bönsel D, Ottich I, Malten A, Zizka G. 2008 An updated list of the vascular plants of Frankfurt am Main (Pteridophyta & Spermatophyta). *Senckenberg Bio* **88**, 111-121.
80. Molebatsi LY. 2011 *An assessment of the useful plant diversity in homegardens and communal land of Tlhakgameng, North-West*. MS Thesis, North-West University, Potchefstroom.
81. Davoren E. 2009 *Plant diversity patterns along a socio-economic gradient in Ganyesa, North-West Province*. MS Thesis, North-West University, Potchefstroom.

82. Krawiecowa A, Rostanski K. 1976 Zależność flory synantropijnej wybranych miast polskich od ich warunków przyrodniczych i rozwoju. *Acta Univ. Wratislaw Pr. Bot.* **303**, 5-61.
83. Falkenberg H, Zündorf H-J. 1987 Die Farn- und Blütenpflanzen des Mittleren Elstergbietes um Gera. *Veröffentlichungen der Museen der Stadt Gera. Naturwissenschaftliche Reihe* **14**, 1-208.
84. Dickson JH, Macpherson P, Watson KJ, Tait T. 2000 *The changing flora of Glasgow: urban and rural plants through the centuries*. Edinburgh: Edinburgh Univ Press.
85. Klotz S. 1984 *Phytoökologische Beiträge zur Charakterisierung und Gliederung urbaner Ökosysteme, dargestellt am Beispiel der Städte Halle und Halle-Neustadt*. Diss. Univ. Halle-Wittenberg, Halle.
86. Coleman EJ, Clarkson BD. 2010 *Cities Biodiversity Index for Hamilton City, New Zealand*. The University of Waikato, Hamilton.
87. Cornes TS, Clarkson BD. 2010 *Assessment of vegetation condition and health at Claudelands Bush (Jubilee Bush; Te Papanui)*. CBER Contract Report 113. Hamilton: The University of Waikato.
88. Clarkson BD, Clarkson BR, Downs TM. 2007 *Indigenous vegetation types of Hamilton Ecological District*. CBER Contract Report 58. Hamilton: The University of Waikato.
89. Cornes TM, Clarkson BD, Beard CM. 2000 Key ecological sites of Hamilton City. CBER Contract Report 5. Hamilton: The University of Waikato.
90. Whaley PT, Clarkson BD, Smale MC. 1997 Claudelands Bush: Ecology of an urban kahikatea (*Dacrycarpus dacrydioides*) forest remnant in Hamilton, New Zealand. *Tane* **36**, 131-155.
91. de Lange, PJ. 1996 Floristic and microclimate of Hammond Bush, a Hamilton Basin forest remnant. *Wellington Botanical Society Bulletin* **47**, 63-80.
92. Egel-Gessner T, Werner P. 1988 *Stadtbiotopkartierung Hanau*. Hanau: Ordnungsamt, Untere Naturschutzbehörde.
93. Thrower L. 1975 The Vegetation of Hong Kong, Its Structure and Change. *Proceedings of a Weekend Symposium of the Royal Asiatic Society, Hong Kong Branch* 21-43.
94. Dolan RW, Moore ME, Stephens JD. 2011 Documenting effects of urbanization on flora using herbarium records. *Journal of Ecology* **99**, 1055-1062.
95. Osma E, Özyiğit İİ, Altay V, Serin M. 2010 Urban vascular flora and ecological characteristics of Kadıköy district, Istanbul, Turkey. *Maejo Int. J. Sci. Technol.* **4**, 64-87.
96. Middleton R. 1998 The plants of Hull: an electronic atlas. *Naturalist* **123**, 24-26.
97. Lavin JC, Wilmore GTD. 1994 *The West Yorkshire Plant Atlas*. Bradford: Bradford City of Bradford Metropolitan Council.
98. Primavesi A, Evans PA. 1988 *Flora of Leicestershire*. Leicester: Leicester Museums.
99. Burton RM. 1983 *Flora of the London area*. London: London Natural History Society.
100. Schwartz MW, Thorne JT, Viers JH. 2006 Biotic Homogenization of the California flora in urban and urbanizing regions. *Biol. Conserv.* **127**, 282-291.
101. Müller N, Mayr E. 2002 *Field investigations to the most frequent vascular plants in Los Angeles, New York and San Francisco from August to October 2002*. Mscr. np.
102. Back H, Nährig D, Spreier B, Thielemann U. 1987 *Stadtbiotopkartierung Mannheim*. Heidelberg: Floristischer Teil, Gesellschaft für Angewandte Ökologie.
103. Duncan RP, et al. 2011 Plant traits and extinction in urban areas: a meta-analysis of 11 cities. *Global Ecol Biogeogr* **20**, 509-519.

104. Gray M, Knight J, Maroondah SGAP. 1993 *Flora of Melbourne: A guide to the indigenous plants of the greater Melbourne area*. Carlton: Hyland House.
105. Tsiotsiou V, Christodoulakis D. 2004 Contribution to the urban ecology of Greece: The flora of Mesolongi city. *Fl. Medit.* **14**, 129-151.
106. Scheuermann R, Wein K. 1983 Die Gartenunkräuter in der Stadt Nordhausen. *Hercynia* **1**, 232-264.
107. Chronopoulos G, Christodoulakis D. 2000 Analysis of the adventive flora of a Greek city: the example of Patras. *Bot. Helv.* **110**, 171–189.
108. Chronopoulos G, Christodoulakis D. 1996 Contribution to the urban ecology of Greece: The flora of the city of Patras and the surrounding area. *Bot. Helv.* **106**, 159-176.
109. Stevens RA. 1990 *A provisional flora and habitat atlas of Plymouth*. Plymouth: Nature Conservancy Council.
110. Nesvadbová J, Sofron J (1997) *Flóra a vegetace města Plzeň*. Plzeň: Západočeské Muzeum.
111. Pyšek A, Pyšek P. 1988 Ruderální flóra Plzně. Sborník Západočeského muzea Plzeň. *Příroda* **68**, 1-34.
112. Lubbe C. 2011 *Comparison of the urban domestic garden flora along a socio-economic gradient in the Tlokwe City Municipality*. MS Thesis, North-West University, Potchefstroom.
113. Lubbe C, Siebert S, Cilliers S. 2010 Political legacy of South Africa affects the plant diversity patterns of urban domestic gardens along a socio-economic gradient. *Sci. Res. Essays* **5**, 2900–2910.
114. Cilliers S, Van Wyk E, Bredenkamp G. 2008 Urban nature conservation: vegetation of natural areas in the Potchefstroom municipal area, North West Province, South Africa. *Koedoe* **42**, 1–30.
115. Cilliers S, Bredenkamp G. 2000 Vegetation of road verges on an urbanisation gradient in Potchefstroom, South Africa. *Landscape Urban Plan.* **46**, 217–239.
116. Cilliers S, Bredenkamp G. 1999 Analysis of the spontaneous vegetation of intensively managed urban open spaces in the Potchefstroom Municipal Area, North West Province, South Africa. *S. Afr. J. Bot.* **65**, 59–68.
117. Cilliers S, Bredenkamp G. 1999 Ruderal and degraded natural vegetation on vacant lots in the Potchefstroom Municipal Area, North West Province, South Africa. *S. Afr. J. Bot.* **65**, 163–173.
118. Cilliers S, Bredenkamp G (1998) Vegetation analysis of railway reserves in the Potchefstroom municipal area, North West Province, South Africa. *S. Afr. J. Bot.* **64**, 271–280.
119. Cilliers S, Schoeman L, Bredenkamp G. 1998 Wetland plant communities in the Potchefstroom Municipal Area, North-West, South Africa. *Bothalia* **28**, 213–229.
120. Špryňar P, Münzbergová Z. 1998 Prodrómus prazské kveteny. *Muzeum a Soucasnost Ser. Nat.* **12**, 129-222.
121. Celesti-Grapow L (1995) *Atlas of the flora of Rome*. Rome: Argos Edizione.
122. San Diego Natural History Museum Botany Department. 2010 *San Diego County Plant Atlas Project*. See <http://sdplantatlas.org/>.
123. Daniel T. 2002 *List of the 50 most frequent vascular plants of San Francisco*. Mscr. np.

124. Klotz S. 1990 Species/area and species/inhabitants relations in European cities. In *Urban Ecology: Plants and Plant Communities in Urban Environments* (eds Sukopp H, Hejný S, Kowarik I), pp 99-103. The Hague: SPB Academic Publishing.
125. Shaw M. 1988 *A flora of Sheffield area: Two hundred years of plant records*. Sheffield: Sorby Natural History Society.
126. Chong KY, Tan HTW, Corlett RT. 2000 *A checklist of the total vascular plant flora of Singapore: native, naturalized and cultivated species*. Singapore: Raffles Museum of Biodiversity Research.
127. Krigas N, Kokkini S. 2005 The indigenous vascular flora of the urban and suburban area of Thessaloniki (N. Greece). *Bot. Chron.* **18**, 29-84.
128. Krigas N, Kokkini S. 2004 A survey of the alien vascular flora of the urban and suburban area of Thessaloniki, N Greece. *Willdenowia* **34**, 81–99.
129. Van der Veken S, Verheyen K, Hermy M. 2004 Plant species loss in an urban area (Turnhout, Belgium) from 1880 to 1999 and its environmental determinants. *Flora* **199**, 516-523.
130. Adler W, Mrkvicka C. 2003 *Die Flora Wiens gestern und heute*. Wien: Naturhistorisches Museum Wien.
131. Chevallerie, H de la, Kopp D, Heybrock G. 1986 *Landschaftsökologische Untersuchung, Band 3: Biotopkartierung*. Landeshauptstadt Wiesbaden: Grünflächenamt.
132. Bertin RI. 2000 *Vascular Flora of Worcester, Massachusetts*. Petersham: New England Botanical Club.
133. Kunick W, Rohner M-S. 1987 *Untersuchungen von Biotopen im Stadtgebiet von Wuppertal*. Stadt Wuppertal: Garten-und Forstamt.
134. Stieglitz W. 1987 *Flora von Wuppertal*. Wuppertal: Jahresberichte des Naturwissenschaftlichen Vereins, Beiheft 1, Wupper-Druck.
135. Landolt E. 2000 *Flora der Stadt Zürich*. Basel: Birkhäuser Verlag.
136. United Nations. 2000 *1998 Demographic Yearbook*. New York: United Nations.
137. Wikipedia. 2011. See <http://en.wikipedia.org/wiki/>.
138. Bristol City Council. 2012 *Key facts about Bristol*. See <http://www.bristol.gov.uk/>.
139. Glasgow City Council. 2012 *Demographic change in Glasgow*. Glasgow: Glasgow City Council.
140. Stadt Grevenbroich. 2006 *Basisdaten*. See <http://www.grevenbroich.de>.
141. Leichester City Council. 2011 *Area of the city*. See <http://www.leicester.gov.uk/>.
142. Schneider A, Friedl MA, Potere, D. 2010 Mapping global urban areas using MODIS 500-m data: New methods and datasets. *Remote Sens. Environ.* **114**, 1733-1746.
143. Arino O, et al. 2008 GLOBCOVER: the most detailed portrait of the earth. *E.S.A. Bulletin* **136**, 24-31.
144. Jarvis A, Reuter HI, Nelson A, Guevara E. 2008 *Hole-filled SRTM for the globe Version 4, available from the CGIAR-CSI SRTM 90m Database*. See <http://srtm.csi.cgiar.org/>.
145. Hijmans RJ, Cameron SE, Parra JL, Jones PG, Jarvis A. 2005 Very high resolution interpolated climate surfaces for global land areas. *Int. J. Climatol.* **25**, 1965-1978.