Supporting Information

Table S1. Network-level metrics and metadata for 48 Neotropical and 17 Afrotropical networks used in the analysis. For each network, we provide a unique identifier (Network ID) and the biogeographic region and country plus the following network metrics: weighted NODF (wNODF), interaction evenness (EVE), modularity (*Q*), and complementary specialization (H_2'). We also provide the following metadata: latitude (Lat, in decimal degrees), longitude (Lon, in decimal degrees), altitude (Alt, m a.s.l.), mean disturbance (mDist, estimated on an ordinal scale from low [1] to high [4]), invasion (Inv, estimated on an ordinal scale from low [1] to high [4]), animal group (Anim Grp, either birds, mammals or both groups), total sampling hours (Sam Hr, hours), sampling focus (Sam Foc, either plant, animal or both foci combined), total species richness (Sp Rich, sum of plant and animal species in the network), and sampling completeness (Sam Comp, the ratio between observed and expected link richness).

Network ID	Region	Country	wNODF	EVE	*Q*	*H2'*	Lat	Lon	Alt	mDist	Inv	Anim Grp	Sam Hr	Sam Foc	Sp Rich	Sam Comp
w1	Neo	Peru	23.8	0.733	0.190	0.294	-13.1	-71.6	1500	1.25	1	birds	960	plant	113	0.792
w2	Neo	Peru	24.6	0.853	0.374	0.336	-13.2	-71.6	3000	1.5	1	birds	720	plant	77	0.794
w3	Neo	Bolivia	10.5	0.880	0.498	0.538	-16.3	-67.5	2100	2.5	2	birds	768	plant	53	0.871
w4	Neo	Bolivia	11.0	0.823	0.575	0.733	-16.3	-67.5	2100	2	2	birds	768	plant	24	0.719
w5	Neo	Bolivia	11.5	0.870	0.553	0.578	-16.4	-67.6	2000	2.5	2	birds	768	plant	54	0.722
w6	Neo	Bolivia	11.4	0.806	0.571	0.701	-16.4	-67.6	2000	2	2	birds	768	plant	30	0.835
w7	Neo	Ecuador	29.6	0.844	0.243	0.224	-4.10	-79.0	1000	1	1	birds	300	plant	77	0.877
w8	Neo	Ecuador	22.5	0.818	0.344	0.398	-4.00	-79.1	2000	1.25	1	birds	300	plant	59	0.814
w9	Neo	Ecuador	11.6	0.912	0.486	0.455	-4.10	-79.2	3000	1.25	1	birds	300	plant	33	0.596
w10	Neo	Ecuador	43.4	0.830	0.224	0.210	-4.08	-79.0	1000	3	2	birds	300	plant	98	0.807
w11	Neo	Ecuador	23.7	0.744	0.321	0.450	-4.00	-79.1	2000	3	2	birds	300	plant	61	0.738
w12	Neo	Ecuador	4.72	0.954	0.676	0.548	-4.10	-79.2	3000	3	2	birds	300	plant	39	0.680
w13	Neo	Colombia	20.0	0.877	0.415	0.424	4.74	-75.4	1800	1.25	1	both	600	plant	75	0.785
w14	Neo	Colombia	12.2	0.849	0.538	0.554	4.72	-75.6	2400	1.25	1	both	600	plant	71	0.856
w15	Neo	Brazil	20.7	0.675	0.410	0.404	-23.5	-45.1	220	3.75	2	birds	304	plant	44	0.544
w16	Neo	Brazil	28.2	0.867	0.376	0.342	-16.0	-48.0	1086	2	1	birds	569	plant	85	0.835
w17	Neo	Brazil	20.9	0.941	0.340	0.304	-22.6	-42.3	85	3.5	1	birds	150	plant	58	0.621
w18	Neo	Brazil	25.4	0.812	0.470	0.451	-19.8	-40.0	50	3	1	birds	527	plant	63	0.875
w19	Neo	Brazil	18.7	0.888	0.416	0.386	-23.5	-46.7	750	3.5	1	birds	64	plant	48	0.692
w20	Neo	Brazil	29.5	0.830	0.412	0.389	-28.5	-47.6	700	4	1	birds	242	plant	40	0.667

Table S1, continued.

Network ID	Region	Country	wNODF	EVE	*Q*	*H2'*	Lat	Lon	Alt	mDist	Inv	Anim Grp	Sam Hr	Sam Foc	Sp Rich	Sam Comp
w21	Neo	Brazil	16.5	0.924	0.394	0.359	-22.8	-47.1	660	3	1	both	360	plant	64	0.639
w22	Neo	Brazil	21.0	0.941	0.368	0.231	-20.8	-42.9	650	2.5	1	birds	250	plant	54	0.523
w23	Neo	Brazil	3.91	0.993	0.300	0.066	-24.3	-48.4	900	1	1	birds	350	plant	267	0.201
w24	Neo	Brazil	22.2	0.841	0.389	0.341	-25.1	-47.9	150	1.25	1	birds	175	plant	65	0.704
w25	Neo	Brazil	35.3	0.823	0.317	0.233	-22.6	-46.4	800	3.75	2	birds	308	both	75	0.598
w26	Neo	Brazil	31.9	0.901	0.351	0.345	-22.4	-47.4	650	4	2	bird	60	plant	35	0.801
w27	Neo	Brazil	12.9	0.876	0.386	0.396	-22.2	-47.3	640	4	3	both	172	animal	73	0.408
w28	Neo	Brazil	9.93	0.854	0.519	0.481	-22.5	-47.2	550	4	2	both	702	both	37	0.583
w29	Neo	Brazil	17.1	0.875	0.414	0.401	-22.3	-47.3	610	4	2	both	766	both	71	0.670
w30	Neo	Brazil	16.8	0.870	0.587	0.569	-22.4	-47.1	570	4	2	both	685	both	51	0.720
w31	Neo	Argentina	33.8	0.791	0.279	0.316	-27.2	-65.6	455	1.5	2	bird	80	both	31	0.893
w32	Neo	Argentina	40.8	0.857	0.225	0.161	-27.3	-65.9	1120	1.25	2	bird	80	both	39	0.576
w33	Neo	Argentina	55.3	0.727	0.109	0.112	-27.0	-65.8	1584	1.25	1	bird	80	both	22	0.855
w34	Neo	Argentina	35.6	0.825	0.297	0.271	-24.7	-64.7	1020	1	1	bird	80	both	43	0.697
w35	Neo	Argentina	58.3	0.854	0.239	0.172	-24.8	-64.7	1309	1	1	bird	80	both	26	0.783
w36	Neo	Argentina	49.8	0.851	0.221	0.162	-24.1	-64.4	1870	1.75	1	bird	80	both	33	0.811
w37	Neo	Argentina	27.2	0.821	0.404	0.365	-23.7	-64.9	1099	1	1	bird	80	both	40	0.807
w38	Neo	Argentina	34.9	0.843	0.345	0.313	-23.0	-64.1	1480	1	1	bird	80	both	35	0.579
w39	Neo	Argentina	37.0	0.885	0.231	0.221	-22.3	-64.7	1635	1.5	1	bird	80	both	30	0.824
w40	Neo	Argentina	48.4	0.511	0.097	0.234	-26.8	-65.3	600	2.25	4	bird	200	plant	18	0.851
w41	Neo	Argentina	29.1	0.749	0.398	0.360	-26.8	-65.3	1100	1.5	1	both	703	both	65	0.803
w42	Neo	Argentina	29.7	0.830	0.422	0.341	-26.8	-65.3	850	1.75	2	both	211	both	47	0.691
w43	Neo	Argentina	40.4	0.569	0.105	0.209	-25.5	-65.0	900	2.25	2	mammal	91	animal	12	0.640
w44	Neo	Argentina	55.9	0.793	0.229	0.166	-24.0	-65.1	1100	1	2	mammal	262	animal	21	0.740
w45	Neo	Argentina	48.6	0.726	0.268	0.431	-25.7	-54.5	200	1.25	2	mammal	232	animal	19	0.788
w46	Neo	Brazil	20.2	0.838	0.222	0.210	-22.8	-43.7	30	4	3	bird	103	plant	42	0.530
w47	Neo	Brazil	19.5	0.568	0.471	0.826	-13.0	-41.3	950	2.25	1	bird	193	plant	19	0.948
w48	Neo	Brazil	19.4	0.897	0.400	0.396	-24.2	-48.0	500	1.75	2	bird	34120	plant	91	0.599

Table S1, continued.

Network ID	Region	Country	wNODF	EVE	*Q*	*H2'*	Lat	Lon	Alt	mDist	Inv	Anim Grp	Sam Hr	Sam Foc	Sp Rich	Sam Comp
w49	Afro	Kenya	21.4	0.840	0.355	0.298	0.40	34.9	1600	1.75	2	both	924	plant	121	0.817
w50	Afro	Tanzania	17.5	0.888	0.549	0.506	-3.31	37.7	800	1.5	2	both	125	plant	64	0.829
w51	Afro	Tanzania	16.0	0.730	0.200	0.524	-3.31	37.2	800	3.5	4	both	125	plant	26	0.992
w52	Afro	Tanzania	35.3	0.852	0.407	0.362	-3.17	37.2	1600	1.5	2	both	125	plant	59	0.900
w53	Afro	Tanzania	21.9	0.870	0.534	0.502	-3.34	37.5	1600	3.5	4	both	125	plant	35	0.798
w54	Afro	Tanzania	36.2	0.623	0.370	0.468	-3.25	37.3	1600	3	4	both	125	plant	29	0.956
w55	Afro	Tanzania	57.4	0.723	0.171	0.172	-3.18	37.2	1600	3.5	3	both	125	plant	21	0.553
w56	Afro	Tanzania	46.2	0.763	0.361	0.281	-3.14	37.2	2400	1.25	2	both	125	plant	40	0.820
w57	Afro	Tanzania	58.4	0.668	0.314	0.271	-3.19	37.5	2400	1.75	2	both	125	plant	23	0.962
w58	Afro	Tanzania	38.4	0.571	0.156	0.272	-3.10	37.3	3000	1.25	1	both	125	plant	30	0.757
w59	Afro	Tanzania	39.5	0.647	0.236	0.359	-3.16	37.4	3000	1.75	1	both	125	plant	17	0.823
w60	Afro	Mozambique	9.45	0.832	0.431	0.432	-20.0	34.4	30	1.25	2	both	140	animal	130	0.374
w61	Afro	South Africa	27.7	0.668	0.409	0.506	-30.7	30.3	500	2	2	bird	288	plant	42	0.820
w62	Afro	South Africa	20.9	0.845	0.402	0.381	-30.7	30.3	500	2	4	bird	486	plant	43	0.653
w63	Afro	South Africa	31.4	0.827	0.318	0.299	-30.3	30.6	500	2	1	bird	1854	plant	84	0.905
w64	Afro	South Africa	41.3	0.834	0.307	0.241	-29.0	31.8	15	3.5	1	bird	482	plant	25	0.996
w65	Afro	Ivory Coast	51.2	0.723	0.244	0.206	9.00	-3.60	275	3.5	2	both	425	plant	75	0.943

Table S2. Scoring scheme of disturbance and invasion levels for the 65 networks. Four disturbance drivers (anthropogenic edge, fragmentation, degradation, defaunation) were assessed on an ordinal scale from 1 to 4 by data collectors of the respective network. Mean disturbance was calculated as the mean score of these four disturbance drivers. Invasion was assessed similarly accounting for invasion by either plants or animals and was treated as a separate predictor variable in statistical analyses.

Anthropogenic edge	**Fragmentation**
1: >1,000 m from habitat border	1: habitat size >10,000 ha
2: <1,000 m from habitat border	2: habitat size 1,000-10,000 ha
3: <100 m from habitat border	3: habitat size 100-1,000 ha
4: <10 m from habitat border	4: habitat size <100 ha
Degradation	**Defaunation**
1: no logging, exploitation etc. during last 50 yrs	1: no spp. locally extinct during last 50 yrs
2: <10% of habitat impacted or converted	2: only a few spp. locally extinct
3: >10% of habitat impacted or converted	3: >10% of spp. locally extinct
4: >50% of habitat impacted or converted	4: >25% of spp. locally extinct

Invasion
1: only native spp.
2: only a few alien spp.
3: >10% of interactions by aliens
4: >25% of interactions by aliens

Table S3. Linear model estimates and standard errors for null-model corrected network-level metrics, including weighted NODF, interaction evenness, modularity (*Q* values) and complementary specialization (H_2'). For this analysis, 48 seed-dispersal interaction networks from the Neotropics were compared to 17 networks from the Afrotropics. Shown are estimates derived from model averaging over the subset of best models with ΔAICc < 2; estimates of 0 indicate that the respective predictor was not included in the subset of best models. Sampling focus was tested as a factorial predictor at three levels: "animals only," "plants only," and "both animals and plants". Animal group was tested as a factorial predictor at three levels: "birds," "mammals," and "both birds and mammals". Continuous predictors (absolute latitude, altitude, disturbance, invasion, sampling completeness, species richness [log-transformed], and sampling hours [log-transformed]) were z-transformed.

	Δ weighted NODF		Δ interaction evenness		Δ modularity *Q*		Δ specialization H_2'	
	No. of best models = 7		No. of best models = 2		No. of best models = 3		No. of best models = 1	
	Estimate	Std. error	Estimate	Std. error	Estimate	Std. error	Estimate	Std. error
Neotropics	**2.20**	**2.80**	**<0.001**	**0.008**	**0.009**	**0.026**	**0.068**	**0.044**
Absolute latitude	0.261	0.760	0	-	0	-	0	-
Altitude	0	-	0	-	0.004	0.009	0	-
Disturbance	0	-	0	-	0.013	0.013	0	-
Invasion	-0.457	0.955	0	-	0	-	0	-
Sampling completeness	-4.05***	1.18	0.003	0.004	0.049***	0.012	0.050**	0.017
log Species richness	0	-	0.009*	0.004	0	-	-0.059**	0.019
log Sampling hours	-2.65*	1.11	-0.011*	0.004	0.039***	0.011	0.055**	0.017
Sampling focus (animals)	0	-	0	-	0	-	0.253*	0.099
Sampling focus (plants)	0	-	0	-	0	-	0.091*	0.039
Animal group (birds)	0	-	0	-	0	-	-0.055	0.017
Animal group (mammals)	0	-	0	-	0	-	-0.374**	0.124

*, $p < 0.05$; **, $p < 0.01$; ***, $p < 0.001$.

Table S4. Linear model estimates and standard errors for binary NODF and weighted nestedness. For this analysis, 48 seed-dispersal interaction networks from the Neotropics were compared to 17 networks from the Afrotropics. Shown are estimates derived from model averaging over the subset of best models with $\Delta AICc < 2$; estimates of 0 indicate that the respective predictor was not included in the subset of best models. Sampling focus was tested as a factorial predictor at three levels: "animals only," "plants only," and "both animals and plants". Animal group was tested as a factorial predictor at three levels: "birds," "mammals," and "both birds and mammals". Continuous predictors (absolute latitude, altitude, disturbance, invasion, sampling completeness, species richness [log-transformed], and sampling hours [log-transformed]) were z-transformed.

	Binary NODF		Weighted nestedness	
	No. of best models = 6		No. of best models = 6	
	Estimate	Std. error	Estimate	Std. error
Neotropics	**-19.5*** **	**5.24**	**-0.071^{+}**	**0.041**
Absolute latitude	0.353	1.26	0	-
Altitude	-0.206	0.839	0	-
Disturbance	0	-	-0.004	0.011
Invasion	-0.345	1.08	0	-
Sampling completeness	0.294	1.04	0.007	0.015
log Species richness	-0.229	0.987	0	-
log Sampling hours	-5.16**	1.88	-0.010	0.016
Sampling focus (animals)	-32.2**	11.0	-0.143*	0.070
Sampling focus (plants)	-11.2*	4.94	-0.155***	0.043
Animal group (birds)	8.08^{+}	4.73	0	-
Animal group (mammals)	57.5***	13.2	0	-

$^{+}$, $p < 0.1$; *, $p < 0.05$; **, $p < 0.01$; ***, $p < 0.001$.