

Conservation of interaction partners between related plants varies widely across communities and between plant families - Supporting Information

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Supporting information 1: Sources for networks

Table S1: Original sources for each network used in our analyses.

Network	Network type	Original source
M_PL_001	Pollination	(Arroyo <i>et al.</i> , 1982)
M_PL_002	Pollination	(Arroyo <i>et al.</i> , 1982)
M_PL_003	Pollination	(Arroyo <i>et al.</i> , 1982)
M_PL_004	Pollination	(Barrett & Helenurm, 1987)
M_PL_005	Pollination	(Clements & Long, 1923)
M_PL_006	Pollination	(Dicks & Corbet, 2012)
M_PL_007	Pollination	(Dicks & Corbet, 2012)
M_PL_008	Pollination	(Dupont <i>et al.</i> , 2003)
M_PL_009	Pollination	(Elberling & Olesen, 1999)
M_PL_010	Pollination	Elberling, H. & Olesen, J. M. Unpublished.
M_PL_011	Pollination	(Olesen <i>et al.</i> , 2002)
M_PL_012	Pollination	Olesen, J. M. Unpublished.
M_PL_013	Pollination	(Ollerton <i>et al.</i> , 2003)
M_PL_014	Pollination	(Hocking, 1968)
M_PL_015	Pollination	(Petanidou, 1991)
M_PL_016	Pollination	(Herrera, 1988)
M_PL_017	Pollination	(Mommott, 2002)
M_PL_018	Pollination	Olesen, J. M. Unpublished.
M_PL_019	Pollination	(Inouye & Pyke, 1988)
M_PL_020	Pollination	(Kevan, 1970)
M_PL_021	Pollination	(Kakutani <i>et al.</i> , 1990a)
M_PL_022	Pollination	(Medan <i>et al.</i> , 2002)
M_PL_023	Pollination	(Medan <i>et al.</i> , 2002)
M_PL_024	Pollination	(Martin, 1965)
M_PL_025	Pollination	(Motten, 1986)
M_PL_026	Pollination	(McMullen, 1993)
M_PL_027	Pollination	(Primack, 1983)
M_PL_028	Pollination	(Primack, 1983)
M_PL_029	Pollination	(Primack, 1983)
M_PL_030	Pollination	(Ramirez, 1992)
M_PL_031	Pollination	(Ramirez, 1989)

Network	Network type	Original source
M_PL_032	Pollination	(Schemske <i>et al.</i> , 1978)
M_PL_033	Pollination	(Small, 1982)
M_PL_034	Pollination	(Dmitrieva <i>et al.</i> , 1997)
M_PL_035	Pollination	(Percival, 1974)
M_PL_036	Pollination	Olesen, J. M. Unpublished.
M_PL_037	Pollination	(Montero, 2005)
M_PL_038	Pollination	(Montero, 2005)
M_PL_039	Pollination	(Stald, 2003)
M_PL_040	Pollination	(Ingversen, 2006)
M_PL_041	Pollination	(Ingversen, 2006)
M_PL_042	Pollination	(Philipp <i>et al.</i> , 2016)
M_PL_043	Pollination	(Montero, 2005)
M_PL_044	Pollination	(Kato, 2000)
M_PL_045	Pollination	(Lundgren & Olesen, 2005)
M_PL_046	Pollination	(Bundgaard, 2003)
M_PL_047	Pollination	(Dupont & Olesen, 2009)
M_PL_048	Pollination	(Dupont & Olesen, 2009)
M_PL_049	Pollination	(Bek, 2006)
M_PL_050	Pollination	(Stald, 2003)
M_PL_051	Pollination	(Vázquez & Simberloff, 2002)
M_PL_052	Pollination	(Witt, 1998)
M_PL_053	Pollination	(Yamazaki & Kato, 2003)
M_PL_054	Pollination	(Kakutani <i>et al.</i> , 1990b)
M_PL_055	Pollination	(Kato, 1996)
M_PL_056	Pollination	(Kato <i>et al.</i> , 1993)
M_PL_057	Pollination	(Inoue <i>et al.</i> , 1990)
M_PL_058	Pollination	(Bartomeus <i>et al.</i> , 2008)
M_PL_059	Pollination	(Bezerra <i>et al.</i> , 2009)
Basset	Herbivory	(Basset & Samuelson, 1996)
Bluthgen	Herbivory	(Blüthgen <i>et al.</i> , 2006)
Bodner	Herbivory	(Bodner <i>et al.</i> , 2010)
Coley	Herbivory	(Coley <i>et al.</i> , 2006)
Ibanez	Herbivory	(Ibanez <i>et al.</i> , 2013)
Joern_altuda	Herbivory	(Joern, 1979)
Joern_marathon	Herbivory	(Joern, 1979)
Novotny	Herbivory	(Novotny <i>et al.</i> , 2012)
Peralta	Herbivory	(Peralta, 2016)
Sheldon	Herbivory	(Sheldon & Rogers, 1978)
Ueckert	Herbivory	(Ueckert & Hansen, 1971)

Supporting information 2: Distributions of p -values for permuted networks

Comparing the permuted networks to permutations of the permuted networks, the slope obtained from the initial permuted network showed no clear relationship to the slopes obtained from 500 permutations of the permuted network. Averaged over the 1000 permutations of each observed network, the slope of the permuted network was more extreme than 48.1-51.3% of the permutations of the permuted network. This confirms that shuffling phylogenetic distances between plant pairs destroys the relationship between distance and interaction partner overlap, and that further shuffling distances does not have a predictable effect.

Networks shown in each panel of Figure S1

All names are as in Table S1. Networks included in each panel (from darkest to lightest line colours) are:

- A) M_PL_001, M_PL_002, M_PL_003, M_PL_004, M_PL_005;
- B) M_PL_006, M_PL_007, M_PL_008, M_PL_009, M_PL_010;
- C) M_PL_011, M_PL_012, M_PL_013, M_PL_014, M_PL_015;
- D) M_PL_016, M_PL_017, M_PL_018, M_PL_019, M_PL_020;
- E) M_PL_021, M_PL_022, M_PL_023, M_PL_024, M_PL_025;
- F) M_PL_026, M_PL_027, M_PL_028, M_PL_029, M_PL_030;
- G) M_PL_031, M_PL_032, M_PL_033, M_PL_034, M_PL_035;
- H) M_PL_036, M_PL_037, M_PL_038, M_PL_039, M_PL_040;
- I) M_PL_041, M_PL_042, M_PL_043, M_PL_044, M_PL_045;
- J) M_PL_046, M_PL_047, M_PL_048, M_PL_049, M_PL_050;
- K) M_PL_051, M_PL_052, M_PL_053, M_PL_054, M_PL_055;
- L) M_PL_056, M_PL_057, M_PL_058, M_PL_059;
- M) Ibanez, Joern_altuda, Joern_marathon, Peralta, Sheldon;
- N) Ueckert, Basset, Bluthgen, Bodner, Coley, Novotny.

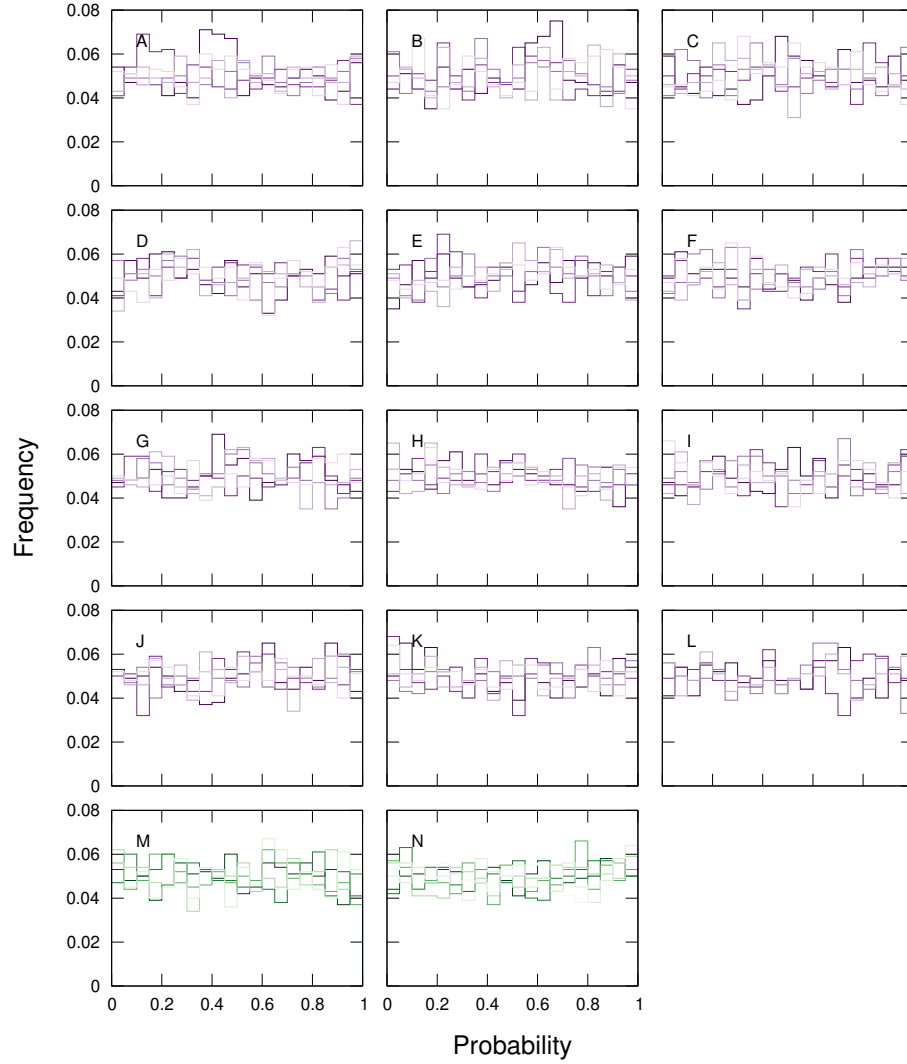


Figure S1: Distributions of p -values obtained when comparing the strength of the relationship between niche overlap and phylogenetic distance in 999 permutations of each network in our dataset with 500 permutations of each permuted network. Each line in each panel represents the histogram of p -values for one network. Bins are 0.05 wide. Purple lines in panels A-L represent pollination networks while green lines in panels M-N represent plant-herbivore networks. A list of networks shown on each panel follows; see Table S1 for original sources.

Supporting information 3: Details of within-family regressions

Models for nine families could not be fit because there was no variation in the phylogenetic distance between plants, their numbers of shared interaction partners, or both. These families were *Amaranthaceae*, *Araliaceae*, *Cactaceae*, *Cornaceae*, *Gentianaceae*, *Liliaceae*, *Oxalidaceae*, *Rhamnaceae*, and *Zingiberaceae*. Further, we could not fit a model for *Sapindaceae* in herbivory networks as all but one plant pair had the same phylogenetic distances.

Only nine families were sufficiently well-represented to fit models for shared herbivores. Five of these were also well-represented in plant-pollinator networks: *Asteraceae*, *Fabaceae*, *Melastomataceae*, *Poaceae*, and *Rubiaceae*. In total, there were 48 families which were well-represented enough to fit models for shared pollinators. Note that singular fits were obtained for *Amaranthaceae*, *Araliaceae*, *Boraginaceae*, *Campanulaceae*, *Caryophyllaceae*, *Ericaceae*, *Geraniaceae*, *Hydrangeaceae*, *Malvaceae*, *Oxalidaceae*, *Primulaceae*, *Saxifragaceae*, and *Verbenaceae*.

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