

Supplementary material

Appendix 1

Table A1. Total number of individuals surveyed per species and month, and total number of individuals in 2015 for each species.

Species	Jan	Feb	Mar	Apr	May	June	July	Sept	Oct	Nov	Dec	Total
<i>Actitis hypoleucos</i>	5	8	22	15	1	0	4	11	1	6	10	83
<i>Alcedo atthis</i>	1	0	0	0	0	0	0	3	10	6	1	21
<i>Anas acuta</i>	1	0	47	1	0	0	0	46	5084	20300	33328	58807
<i>Anas clypeata</i>	7331	3485	5895	2254	14	150	155	3668	20099	67517	97170	207738
<i>Anas crecca</i>	156	310	89	1	0	0	10	25	206	1235	531	2563
<i>Anas penelope</i>	30	28	6	0	0	0	0	7	5538	9006	3609	18224
<i>Anas platyrhynchos</i>	3686	2648	3685	979	892	6076	3216	6728	8690	15284	8479	60363
<i>Anas querquedula</i>	0	0	16	6	1	0	0	0	0	0	0	23
<i>Anas spp.</i>	0	0	0	0	0	0	0	0	1000	0	0	1000
<i>Anas strepera</i>	124	311	390	169	227	854	69	104	570	568	1677	5063
<i>Anser anser</i>	0	0	0	0	0	0	0	0	0	4	0	4
<i>Ardea cinerea</i>	209	153	192	97	60	106	248	303	125	161	225	1879
<i>Ardea purpurea</i>	0	0	0	0	0	8	1	0	1	0	0	10
<i>Arenaria interpres</i>	0	0	0	0	2	0	2	0	0	0	0	4
<i>Aythya ferina</i>	1522	1772	1895	765	652	1603	425	247	3616	3747	4066	20310
<i>Aythya fuligula</i>	0	0	0	0	0	0	0	0	0	0	6	6
<i>Aythya nyroca</i>	0	0	0	1	0	0	0	0	0	2	7	10
<i>Bubulcus ibis</i>	0	12	17	1	5	0	8	0	0	2	0	45
<i>Calidris alba</i>	0	0	0	0	8	0	0	3	2	0	0	13
<i>Calidris alpina</i>	2614	2730	1015	1800	913	150	840	767	600	120	0	11549
<i>Calidris canutus</i>	0	0	0	0	3	0	0	0	0	0	0	3
<i>Calidris ferruginea</i>	0	0	3	1100	492	361	940	5	0	0	0	2901
<i>Calidris minuta</i>	0	0	0	1110	99	0	0	197	5	125	0	1536
<i>Casmerodius albus</i>	13	9	5	0	1	0	1	1	1	10	19	60
<i>Charadrius alexandrinus</i>	840	0	450	0	5	2	20	60	0	0	0	1377
<i>Charadrius dubius</i>	0	0	0	0	2	0	0	33	0	0	0	35
<i>Charadrius hiaticula</i>	0	0	62	440	451	135	60	1009	0	30	0	2187
<i>Chlidonias hybrida</i>	0	0	0	17	0	0	41	9	0	0	0	67
<i>Chlidonias leucopterus</i>	0	0	0	1	0	0	0	0	0	0	0	1
<i>Chlidonias niger</i>	0	0	0	111	19	0	0	0	0	0	0	130
<i>Clangula hyemalis</i>	0	0	1	0	0	0	0	0	0	0	0	1
<i>Egretta garzetta</i>	92	171	171	124	99	245	621	677	150	196	121	2667
<i>Fulica atra</i>	1330	463	1266	742	2077	3344	3176	5426	5827	7508	5943	37102
<i>Fulica cristata</i>	0	0	0	1	0	0	2	2	0	0	1	6
<i>Gallinago gallinago</i>	8	12	0	2	0	0	0	2	2	0	6	32
<i>Gallinula chloropus</i>	1	5	4	9	14	2	5	3	5	3	17	68
<i>Glareola pratincola</i>	0	0	0	18	0	0	1	0	0	0	0	19
<i>Himantopus himantopus</i>	977	258	753	1007	619	465	3145	1312	221	587	1561	10905
<i>Ixobrychus minutus</i>	0	0	0	0	0	1	0	0	0	0	0	1
<i>Larus fuscus</i>	0	15	0	0	0	0	0	12	0	0	345	372
<i>Larus genei</i>	0	0	3	154	857	827	230	0	0	95	0	2166
<i>Larus michahellis</i>	72	261	583	216	108	202	189	501	292	186	37	2647
<i>Larus minutus</i>	0	1	0	0	0	0	0	0	0	0	0	1
<i>Larus ridibundus</i>	1761	860	4441	2475	2849	2114	5953	5929	495	2072	1239	30188
<i>Limosa lapponica</i>	0	0	15	0	2	9	0	0	0	1	0	27
<i>Limosa limosa</i>	7840	3611	1694	563	0	1000	3076	2059	9220	18425	16308	63796
<i>Marmaronetta angustirostris</i>	0	0	13	48	4	2	5	0	13	9	0	94
<i>Netta rufina</i>	171	560	1033	918	409	526	60	3	1834	7111	11076	23701
<i>Numenius arquata</i>	160	59	105	7	3	6	18	15	0	40	74	487
<i>Numenius phaeopus</i>	0	0	0	0	0	2	1	0	0	0	0	3

<i>Nycticorax nycticorax</i>	0	0	0	54	9	9	125	37	0	0	0	234
<i>Oxyura leucocephala</i>	165	188	114	54	19	28	22	122	200	334	138	1384
<i>Phalacrocorax carbo</i>	1029	327	206	12	1	0	0	2	97	240	622	2536
<i>Philomachus pugnax</i>	14	2	0	98	0	0	45	76	4	30	190	459
<i>Phoeniconaias minor</i>	4	8	2	1	0	0	0	0	0	0	1	16
<i>Phoenicopterus roseus</i>	12099	11250	10800	6379	6559	12587	13139	13651	19979	29846	32163	168452
<i>Platalea leucorodia</i>	399	360	326	144	217	81	1249	462	208	546	693	4685
<i>Plegadis falcinellus</i>	190	204	324	29	39	35	98	5	0	0	158	1082
<i>Pluvialis apricaria</i>	0	0	0	0	0	0	0	0	0	50	0	50
<i>Pluvialis squatarola</i>	66	232	327	107	109	16	0	0	22	40	52	971
<i>Podiceps cristatus</i>	53	22	109	112	77	99	77	145	116	137	85	1032
<i>Podiceps nigricollis</i>	496	372	839	446	132	112	649	952	1160	4897	2692	12747
<i>Porphyrio porphyrio</i>	4	8	3	1	16	4	0	3	7	8	20	74
<i>Recurvirostra avosetta</i>	7547	5132	3597	2759	1892	2656	3253	2529	3002	7117	8011	47495
<i>Sterna albifrons</i>	0	0	0	3	0	0	107	128	0	0	0	238
<i>Sterna caspia</i>	5	3	2	2	3	2	0	0	0	0	0	17
<i>Sterna nilotica</i>	0	0	0	14	0	17	43	0	0	0	0	74
<i>Tachybaptus ruficollis</i>	285	293	186	17	15	346	1048	608	3130	1654	856	8438
<i>Tadorna tadorna</i>	1149	1085	1121	158	114	200	64	2	22	187	5125	9227
<i>Tringa erythropus</i>	2	3	9	24	0	0	134	53	16	76	0	317
<i>Tringa nebularia</i>	22	34	64	49	1	0	6	57	14	2	1	250
<i>Tringa ochropus</i>	9	12	44	2	2	0	10	17	52	2	11	161
<i>Tringa stagnatilis</i>	0	0	0	1	0	0	0	0	0	0	0	1
<i>Tringa totanus</i>	71	122	214	63	20	152	921	118	147	115	19	1962
<i>Vanellus vanellus</i>	15	13	0	0	0	0	2	30	1	12	41	114

Table A2. List of species with significantly negative co-occurrence and larger phylogenetic distance than the average for the assemblage. Each pair of species only showed significantly negative co-occurrence in one month ($P < 0.05$). After correction for multiple testing, none of these species pairs showed a significant co-occurrence.

Species 1	Species 2
<i>Actitis hypoleucos</i>	<i>Anas platyrhynchos</i>
<i>Actitis hypoleucos</i>	<i>Tachybaptus ruficollis</i>
<i>Anas acuta</i>	<i>Tringa ochropus</i>
<i>Anas platyrhynchos</i>	<i>Calidris alpina</i>
<i>Anas platyrhynchos</i>	<i>Larus michahellis</i>
<i>Anas platyrhynchos</i>	<i>Pluvialis squatarola</i>
<i>Anas platyrhynchos</i>	<i>Larus michahellis</i>
<i>Anas strepera</i>	<i>Recurvirostra avosetta</i>
<i>Anas strepera</i>	<i>Larus ridibundus</i>
<i>Anas strepera</i>	<i>Fulica atra</i>
<i>Ardea cinerea</i>	<i>Plegadis falcinellus</i>
<i>Ardea cinerea</i>	<i>Podiceps cristatus</i>
<i>Aythya ferina</i>	<i>Himantopus himantopus</i>
<i>Chlidonias hybrida</i>	<i>Himantopus himantopus</i>
<i>Egretta garzetta</i>	<i>Porphyrio porphyrio</i>
<i>Fulica atra</i>	<i>Calidris minuta</i>
<i>Fulica atra</i>	<i>Tringa nebularia</i>
<i>Fulica atra</i>	<i>Tringa totanus</i>
<i>Himantopus himantopus</i>	<i>Netta rufina</i>
<i>Himantopus himantopus</i>	<i>Anas strepera</i>
<i>Larus michahellis</i>	<i>Platalea leucorodia</i>
<i>Larus michahellis</i>	<i>Tachybaptus ruficollis</i>
<i>Larus michahellis</i>	<i>Podiceps nigricollis</i>
<i>Limosa limosa</i>	<i>Tachybaptus ruficollis</i>
<i>Phalacrocorax carbo</i>	<i>Podiceps nigricollis</i>

Podiceps cristatus

Recurvirostra avosetta

Podiceps nigricollis

Recurvirostra avosetta

Recurvirostra avosetta

Tachybaptus ruficollis

Recurvirostra avosetta

Aythya ferina

Tachybaptus ruficollis

Tadorna tadorna

Fig. A1. Representation of one of the 100 equiprobable trees used in this study

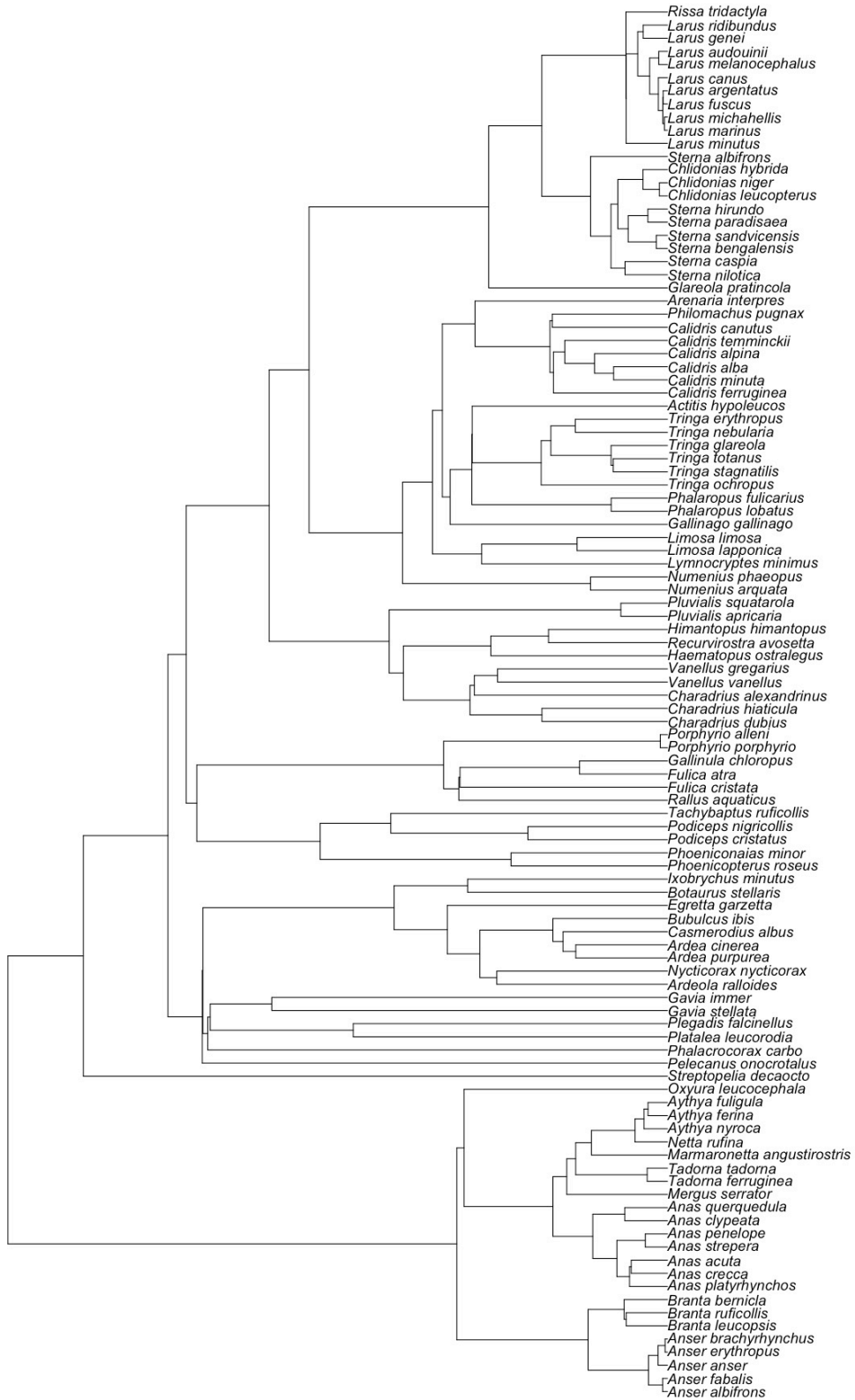


Fig. A2. Histogram of the standardized effect size of the Z-MNTD phylogenetic diversity of the pond community for different ponds and months in relation to water level. a) Results for the pond communities in all the ponds, b) results for pond communities in the ponds with medium or high water level. Water level as follows: 0 totally dry, 1 almost dry, 2 low level, 3 medium level, 4 high level. Numbers represent the number of pond counts included in each water level. There were no significant differences between water level categories.

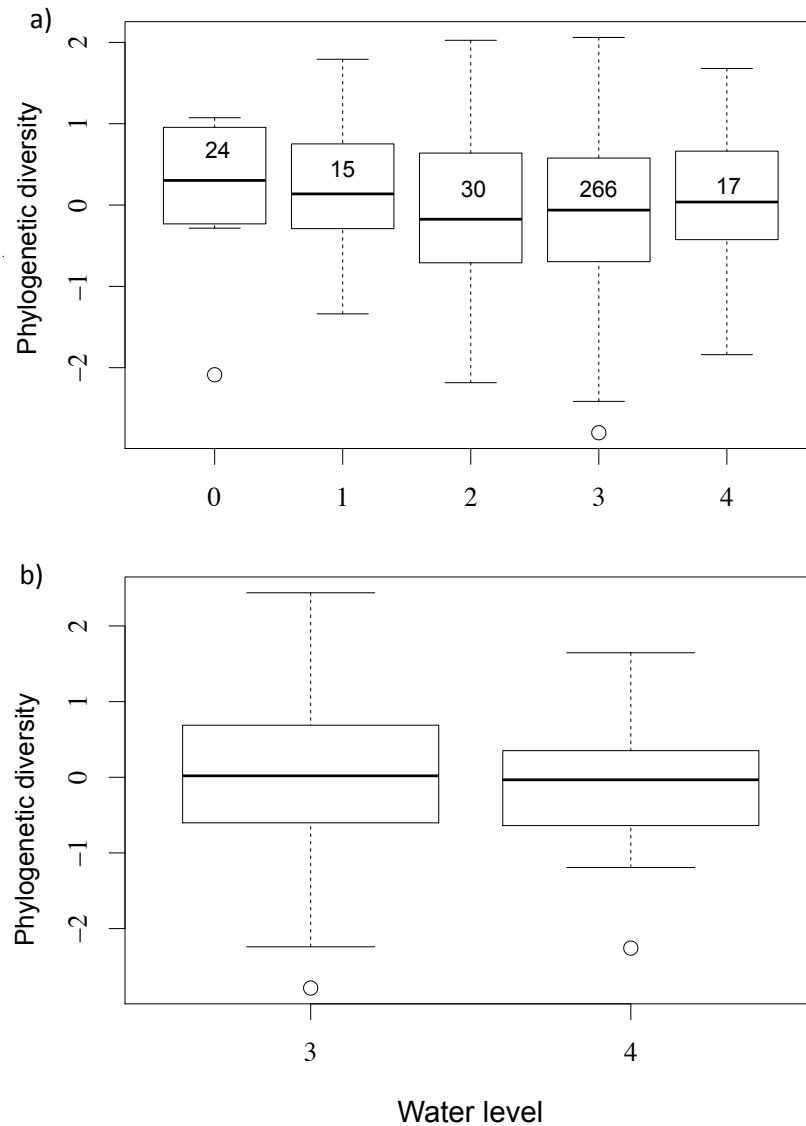


Fig. A3. Pie chart representing the proportion of pond communities during the 11 monthly surveys that have a phylogenetically clustered (i.e. phylogenetically related species recorded together in the same ponds), random (i.e. species occurring randomly across ponds and months) or phylogenetically overdispersed (i.e. phylogenetically unrelated species recorded together) pond community based on the Z-MNTD metric. Each pond is included 11 times (one per month) in the plot. Both significant ($p < 0.05$) and marginally significant ($P < 0.1$) pond communities are shown. Results for two null models are shown: Independent swap (i.e. maintains species frequency, so it is an abundance weighted measure) and sample pool (selects one species randomly from the total pool). Results are for both a) all the ponds ($N = 352$ pond communities) and b) ponds with medium or high water level ($N = 283$ pond communities). After correction for multiple testing ($p < 0.001$) all pond communities were random.

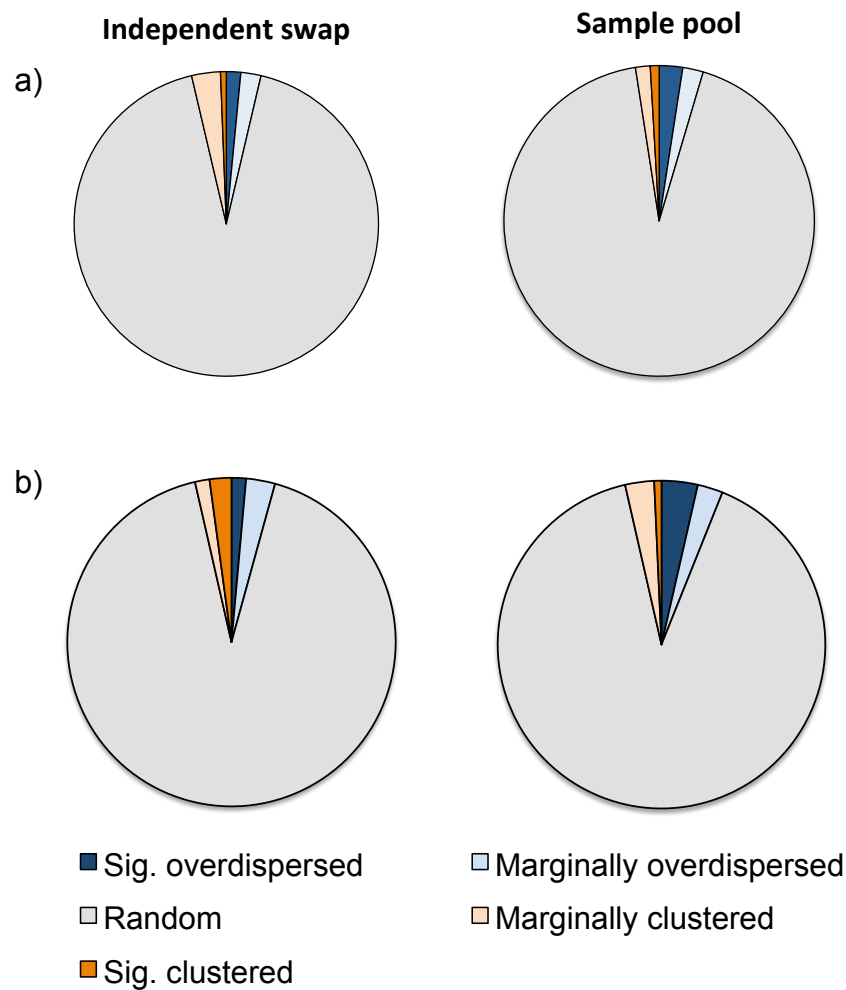
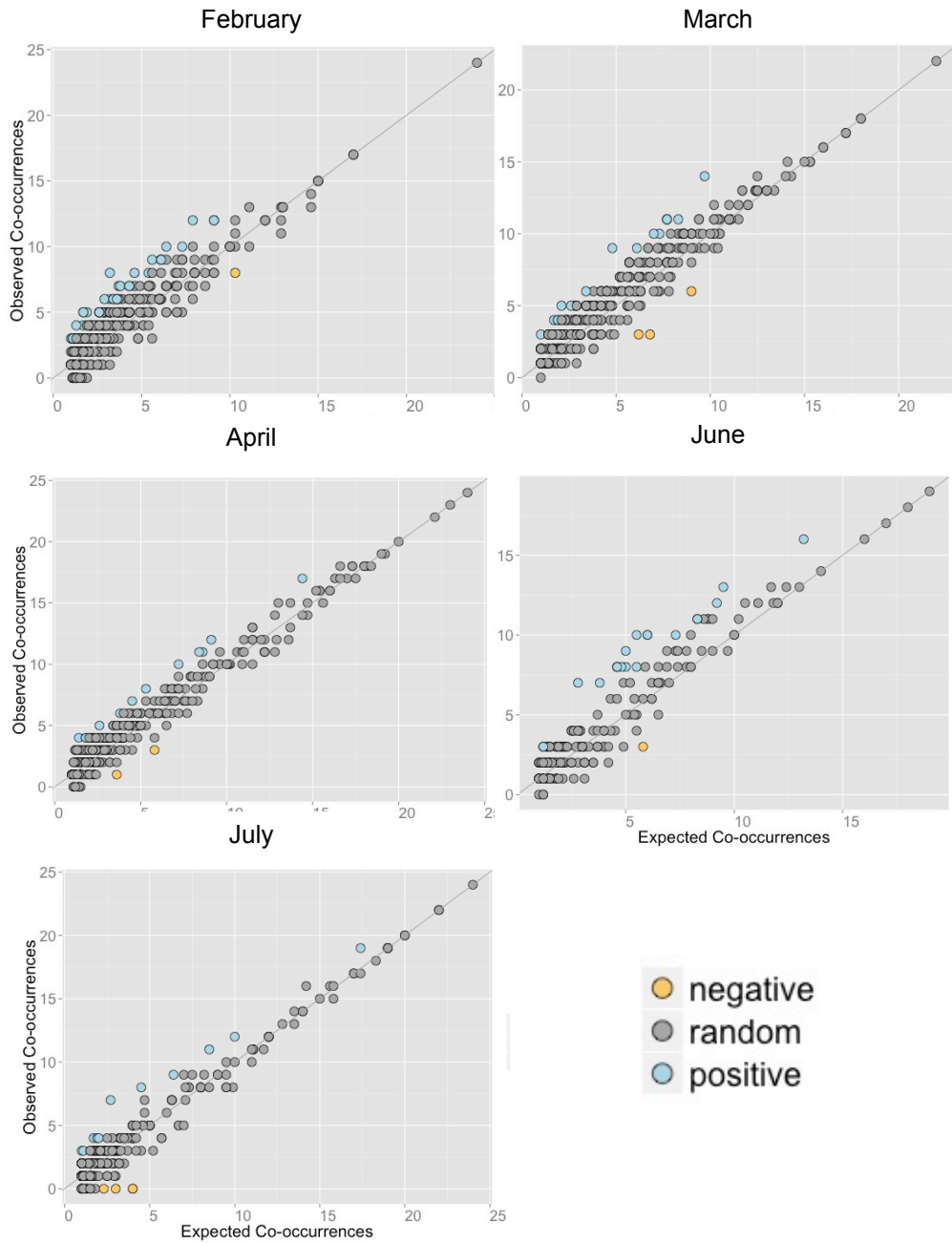
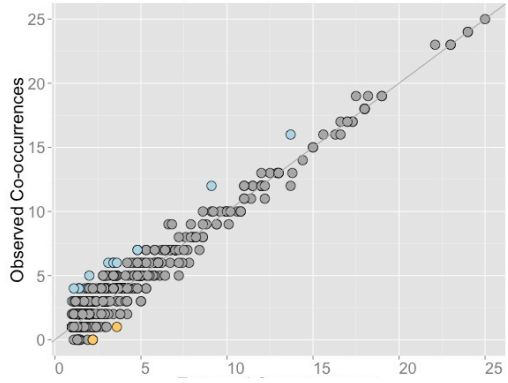


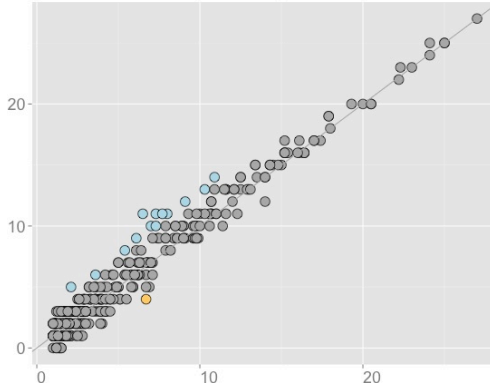
Fig. A4. Relationship among the observed and expected co-occurrences among species pairs in each of the months. We also identify the species pair interactions that are random, significantly negative, and significantly positive ($P < 0.05$). Similar results for January and May are provided in Fig. 3.



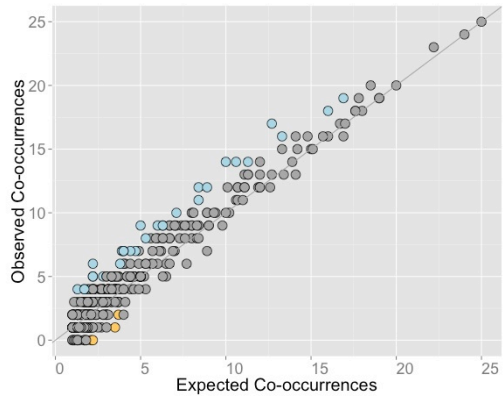
September



October



November



December

