

Stability

2022-07-27

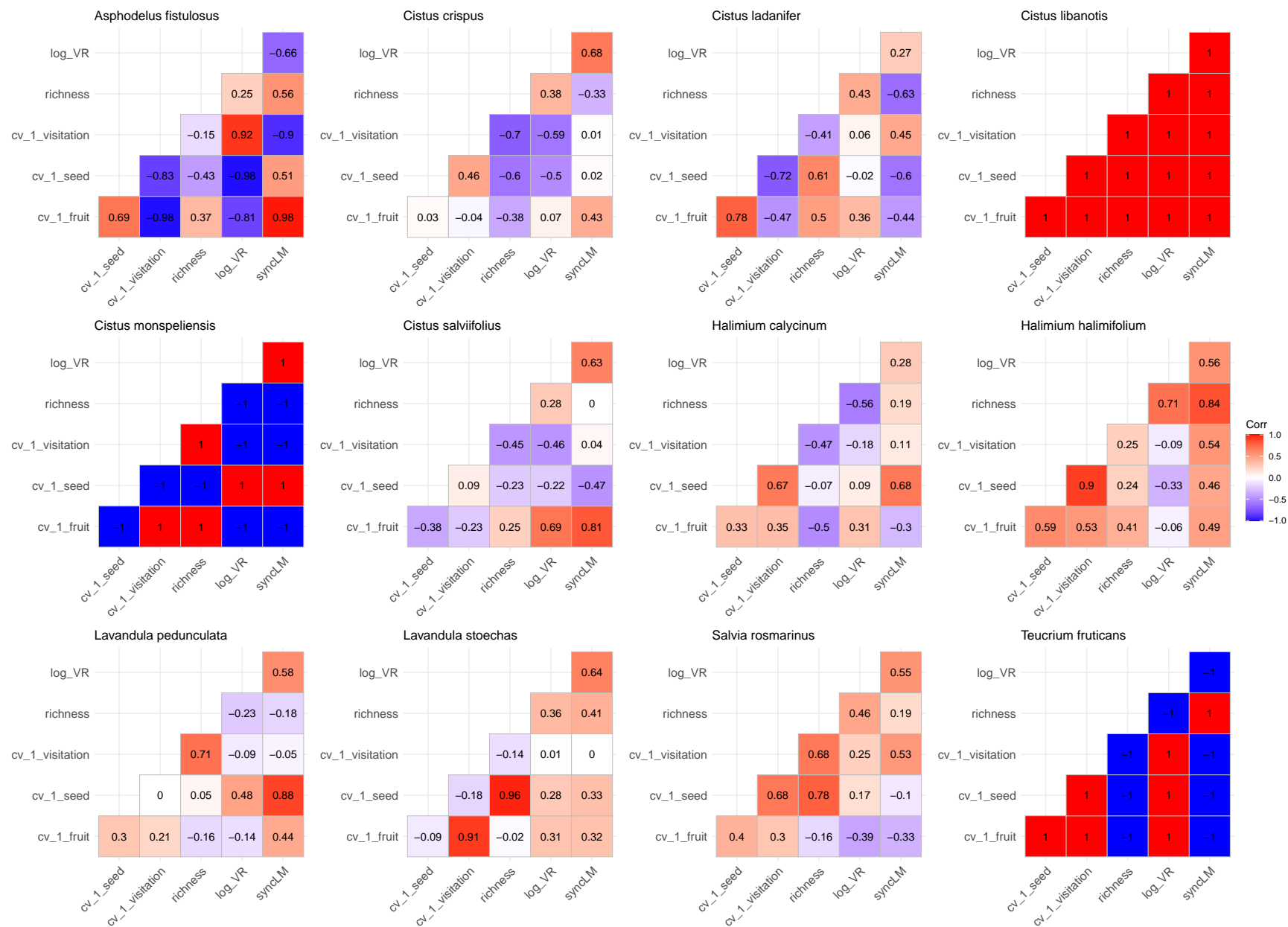
For each plant species per site, stability (inverse of the coefficient of variation) of the visitation rate of pollinators (visitation rate calculated like frequency/flower abundance) and also of the fruit proportion and the seed numbers were calculated. Pollinator richness was obtained and furthermore, the log of variance ratio (Lepš et al., 2018) and Loreau & Mazancourt synchrony index were calculated.

Positive values of log var ratio signify synchronization, negative values indicate compensatory dynamics (Lepš et al., 2018). Loreau & Mazancourt index is standardized between 0 (perfect asynchrony) and 1 (perfect synchrony).

note: NA= one data per year

Plant_gen_sp	Site_ID	cv_1_fruit	cv_1_seed	cv_1_visitation	richness	log_VR	syncLM
Asphodelus fistulosus	Aznalcazar	8.4489	2.0475	1.0753	15	-0.9651	0.0696
Asphodelus fistulosus	Niebla	6.7846	4.6834	1.0053	4	-1.6094	0.0400
Asphodelus fistulosus	Pino_del_cuervo	1.1568	Inf	26.5670	8	-Inf	0.0000
Cistus crispus	Aznalcazar	4.0874	5.7057	1.2821	20	-0.3545	0.0987
Cistus crispus	Bonares	21.5000	4.8067	1.4643	10	0.0817	0.2488
Cistus crispus	Convento_de_la_luz	4.6234	9.1924	2.2753	4	-1.0986	0.1111
Cistus crispus	El_pozo	6.5389	4.1119	1.2259	15	-0.1694	0.0838
Cistus crispus	Esparragal	3.4950	3.8084	1.2549	31	-0.3926	0.0550
Cistus crispus	Niebla	3.4080	3.6648	1.7978	17	-0.4895	0.0781
Cistus crispus	Pino_del_cuervo	4.9823	4.3076	1.7244	17	0.1810	0.2062
Cistus crispus	Urbanizaciones	2.1975	3.9685	1.2250	23	1.0144	0.2611
Cistus crispus	Villamanrique_este	6.5557	6.9020	1.0752	25	0.0152	0.1132
Cistus crispus	Villamanrique_sur	5.7195	2.4235	1.3503	31	-0.0515	0.0620
Cistus ladanifer	Aznalcazar	12.3095	2.1865	1.2619	27	-0.7370	0.0345
Cistus ladanifer	Bonares	32.6667	2.5078	0.8138	13	-0.8168	0.0962
Cistus ladanifer	Convento_de_la_luz	5.7020	1.3613	1.4969	13	0.0690	0.1314
Cistus ladanifer	El_pozo	Inf	1.3902	1.9193	3	-1.0986	0.1111
Cistus ladanifer	Niebla	43.4871	2.1164	1.6872	19	0.1773	0.0848
Cistus ladanifer	Pino_del_cuervo	26.7095	1.9872	1.0369	12	-0.9676	0.0350
Cistus ladanifer	Villamanrique_este	Inf	1.5972	1.8385	4	-1.0986	0.1111
Cistus ladanifer	Villamanrique_sur	3.5099	1.6880	1.3703	9	-0.4055	0.1213
Cistus libanotis	La_rocina	Inf	2.3401	1.5191	15	-0.5436	0.0702
Cistus libanotis	Pinares_de_hinojos	22.9149	3.4770	1.6418	27	0.3743	0.1069
Cistus monspeliensis	Aznalcazar	2.6640	10.4062	1.4302	11	0.8755	0.3108
Cistus monspeliensis	Niebla	14.1776	2.6691	1.5319	18	-0.5108	0.0510
Cistus salviifolius	Aznalcazar	20.7197	2.3589	0.8011	23	-0.2721	0.0692
Cistus salviifolius	Bonares	9.1900	2.9858	0.7797	31	-0.0531	0.0747
Cistus salviifolius	Convento_de_la_luz	Inf	2.3454	0.9612	7	0.0870	0.1563
Cistus salviifolius	El_pozo	Inf	4.3212	6.9296	3	-1.0986	0.1111
Cistus salviifolius	Esparragal	14.6146	2.2747	1.0299	14	-0.2744	0.0620
Cistus salviifolius	La_cunya	77.8152	1.4563	1.2246	14	1.1104	0.3242
Cistus salviifolius	Pinares_de_hinojos	18.3712	4.1346	1.0542	8	-0.1278	0.1375
Cistus salviifolius	Pino_del_cuervo	7.7782	1.2804	2.5927	3	-1.0986	0.1111
Cistus salviifolius	Urbanizaciones	11.6667	6.7449	1.0855	12	-0.8232	0.0650
Cistus salviifolius	Villamanrique_este	5.5000	2.7868	1.5164	11	-1.3863	0.0336
Cistus salviifolius	Villamanrique_sur	Inf	5.6569	1.0689	2	-Inf	0.0000
Halimium calycinum	Bonares	Inf	7.5000	1.8088	6	0.0000	0.4011
Halimium calycinum	Esparragal	Inf	2.2199	0.6008	7	-1.8458	0.0264
Halimium calycinum	La_rocina	NA	NA	NA	3	NA	NA

Halimium calycinum	Pino_del_cuervo	2.5846	7.7782	13.1522	3	-1.0986	0.1111
Halimium calycinum	Urbanizaciones	5.3666	4.6346	1.9427	4	-Inf	0.0000
Halimium calycinum	Villamanrique_sur	Inf	3.4017	1.1742	8	-1.3863	0.0625
Halimium halimifolium	Bonares	5.5861	3.0592	1.5721	14	-0.2196	0.0858
Halimium halimifolium	Convento_de_la_luz	4.5659	2.2596	0.8767	35	0.8373	0.1880
Halimium halimifolium	El_pozo	3.1667	2.6407	0.8091	6	-1.0986	0.0724
Halimium halimifolium	Esparragal	3.9035	2.7823	1.4877	21	-0.0585	0.1630
Halimium halimifolium	La_rocina	NA	NA	NA	2	NA	NA
Halimium halimifolium	Pinares_de_hinojos	2.7920	2.9184	1.7234	12	0.1691	0.1572
Halimium halimifolium	Pino_del_cuervo	4.6188	3.2883	1.3648	5	-1.3863	0.0625
Halimium halimifolium	Urbanizaciones	6.0476	1.5673	0.7998	12	-0.1054	0.1236
Lavandula pedunculata	Aznalcazar	4.2243	4.4054	1.6164	23	-0.5792	0.0873
Lavandula pedunculata	Bonares	10.1518	Inf	1.7129	3	-Inf	0.0000
Lavandula pedunculata	Convento_de_la_luz	17.5745	13.4350	0.7071	4	0.6931	0.4444
Lavandula pedunculata	El_pozo	6.0242	7.5056	1.3377	6	0.2624	0.2868
Lavandula pedunculata	Esparragal	21.8885	2.0348	0.8636	3	-1.7346	0.0652
Lavandula pedunculata	La_cunya	17.8828	4.8372	1.7765	10	-0.1625	0.3078
Lavandula pedunculata	La_rocina	19.9391	4.8333	1.7980	11	0.4700	0.2457
Lavandula pedunculata	Niebla	9.9773	4.3452	2.4245	25	-0.7366	0.0319
Lavandula pedunculata	Urbanizaciones	13.5102	4.4903	1.6194	15	-0.2088	0.1262
Lavandula pedunculata	Villamanrique_sur	NA	NA	NA	2	NA	NA
Lavandula stoechas	Aznalcazar	NA	NA	NA	2	NA	NA
Lavandula stoechas	Bonares	12.7609	5.1406	1.4581	8	-0.3075	0.2076
Lavandula stoechas	Convento_de_la_luz	NA	NA	NA	0	NA	NA
Lavandula stoechas	Esparragal	42.1780	Inf	5.6569	2	NaN	NaN
Lavandula stoechas	Niebla	3.6715	1.7960	1.0325	5	-1.4663	0.0579
Lavandula stoechas	Pino_del_cuervo	14.9338	5.8336	0.5137	13	1.2238	0.6475
Lavandula stoechas	Urbanizaciones	6.6367	4.9008	1.9159	9	0.1178	0.1406
Lavandula stoechas	Villamanrique_sur	25.9845	1.4450	2.3389	4	0.6931	1.0000
Salvia rosmarinus	Aznalcazar	NaN	Inf	0.9114	3	0.5878	1.0000
Salvia rosmarinus	Convento_de_la_luz	30.6076	4.9497	0.7071	1	-Inf	0.0000
Salvia rosmarinus	El_pozo	NA	NA	NA	2	NA	NA
Salvia rosmarinus	La_cunya	7.4246	3.7376	1.2765	3	0.0000	1.0000
Salvia rosmarinus	La_rocina	NA	NA	NA	1	NA	NA
Salvia rosmarinus	Urbanizaciones	13.0552	8.9469	1.3197	6	-Inf	0.0000
Salvia rosmarinus	Villamanrique_sur	2.1213	9.1924	0.9677	6	0.6539	0.5102
Teucrium fruticans	Aznalcazar	4.3299	2.2584	2.2438	31	-0.5261	0.0858
Teucrium fruticans	Convento_de_la_luz	41.7193	4.2426	13.7054	8	-Inf	0.0000



Data with species in more than 3 sites. I removed 4 plant species (A.fistulosus, C.libanotis, c.monspeliensis, T.fructicans)

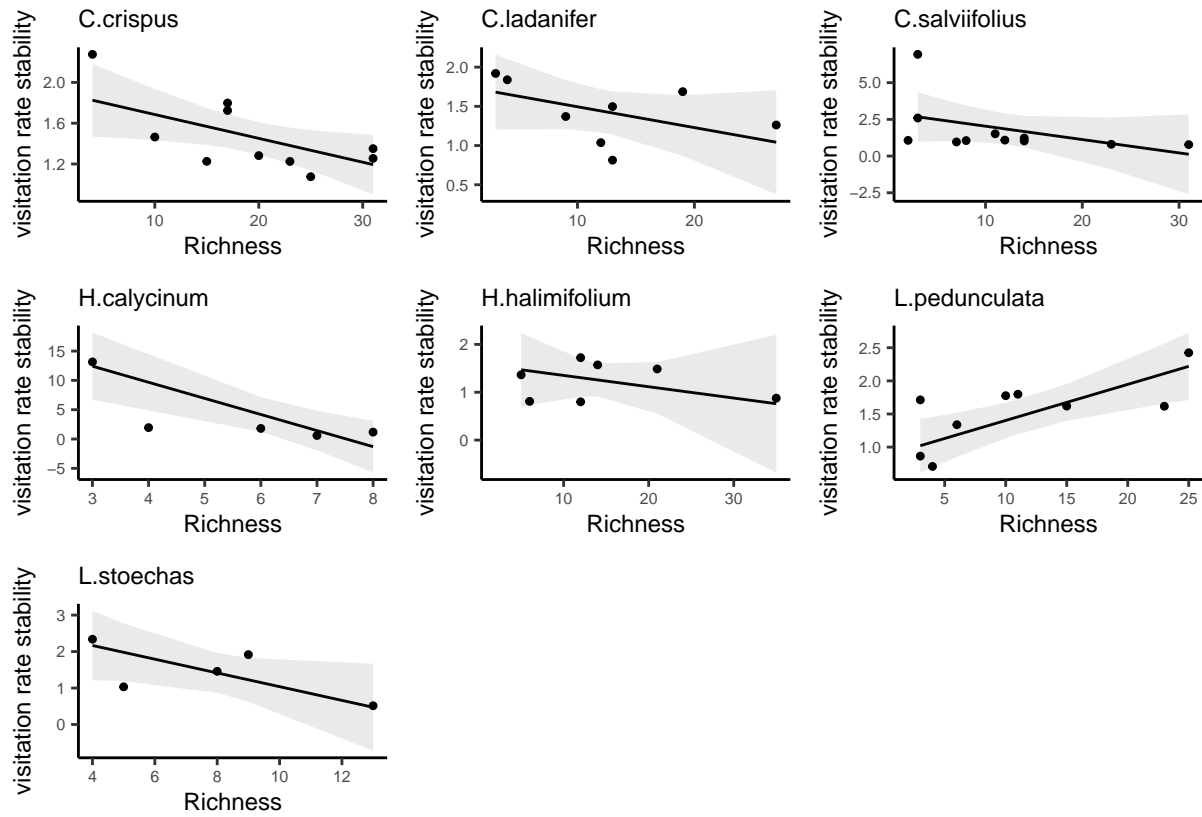
We analysed whether the visitation rate stability is affected by richness and synchrony for each plant species separately.

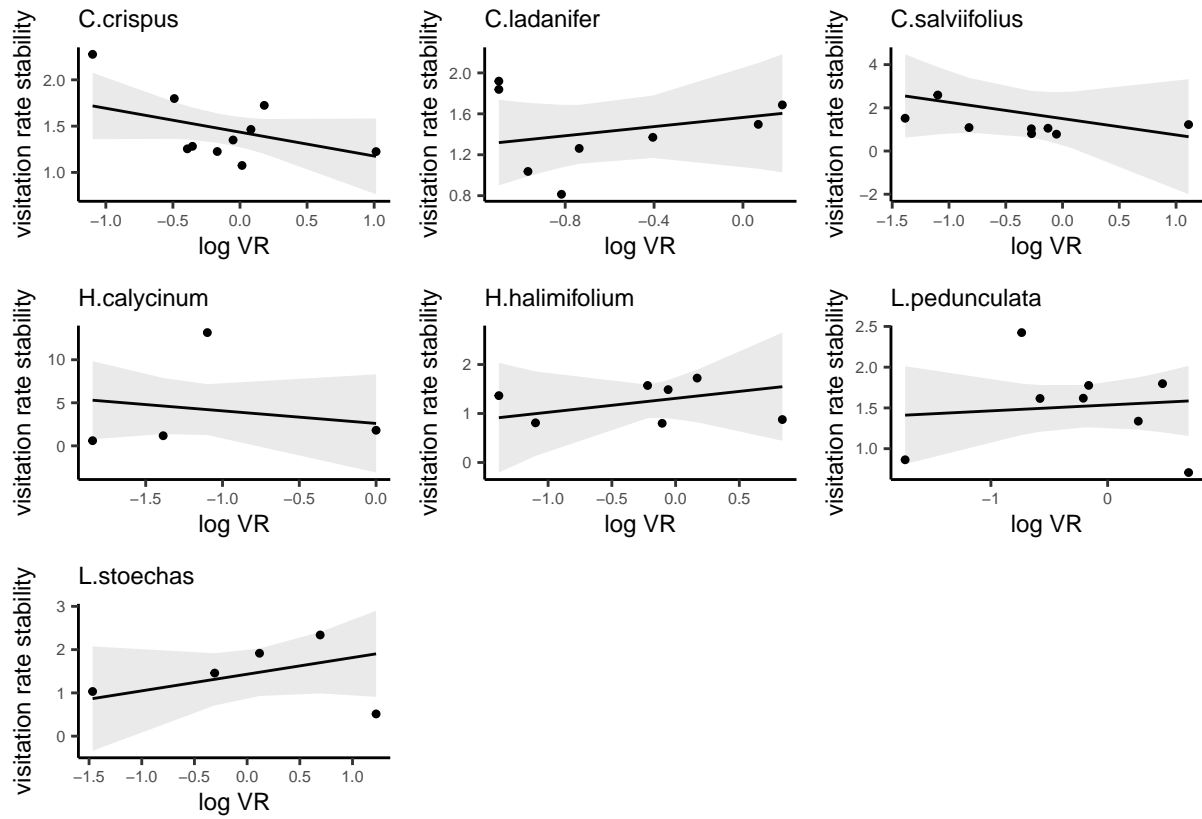
A) richness + log VR

Plant_gen_sp	term	estimate	std.error	statistic	p.value
Cistus crispus	(Intercept)	1.8862	0.2292	8.2288	0.0001
	richness	-0.0234	0.0107	-2.1952	0.0642
	log_VR	-0.2578	0.1689	-1.5265	0.1707
Cistus ladanifer	(Intercept)	1.8970	0.4192	4.5252	0.0063
	richness	-0.0266	0.0212	-1.2525	0.2658
	log_VR	0.2236	0.3287	0.6802	0.5266
Cistus salviifolius	(Intercept)	2.6471	1.1746	2.2536	0.0589
	richness	-0.0910	0.0697	-1.3052	0.2331
	log_VR	-0.7549	0.8300	-0.9095	0.3933
Halimium calycinum	(Intercept)	19.0767	5.2029	3.6666	0.1695
	richness	-2.7456	0.8348	-3.2890	0.1879
	log_VR	-1.4604	2.2983	-0.6354	0.6396
Halimium halimifolium	(Intercept)	1.6637	0.6725	2.4738	0.0687
	richness	-0.0236	0.0357	-0.6626	0.5438
	log_VR	0.2844	0.4862	0.5851	0.5899
Lavandula pedunculata	(Intercept)	0.8755	0.2464	3.5533	0.0163
	richness	0.0545	0.0174	3.1372	0.0257
	log_VR	0.0718	0.1859	0.3863	0.7152
Lavandula stoechas	(Intercept)	2.8998	0.8495	3.4137	0.0761
	richness	-0.1882	0.1041	-1.8074	0.2124
	log_VR	0.3846	0.3612	1.0649	0.3985
Salvia rosmarinus	(Intercept)	1.1791			
	richness	0.0325			
	log_VR	-0.6211			

Goodness of fit measures, p-values for hypothesis tests on residuals, and model convergence information.

Plant_gen_sp	r.squared	adj.r.squared	sigma	statistic	p.value	df	logLik	AIC	BIC	deviance	df.residual	nobs
C.crispus	0.617	0.507	0.256	5.628	0.035	2	1.238	5.523	6.733	0.457	7	10
C.ladanifer	0.242	-0.061	0.398	0.798	0.500	2	-2.094	12.189	12.506	0.791	5	8
C.salviifolius	0.360	0.177	1.704	1.965	0.210	2	-17.739	43.477	44.688	20.337	7	10
H. calycinum	0.916	0.747	3.016	5.435	0.290	2	-7.319	22.638	20.183	9.096	1	4
H.halimifolium	0.099	-0.351	0.458	0.220	0.812	2	-2.510	13.021	12.805	0.840	4	7
L.pedunculata	0.664	0.529	0.376	4.935	0.066	2	-1.652	11.304	11.621	0.708	5	8
L.stoechas	0.621	0.242	0.625	1.639	0.379	2	-2.450	12.900	11.338	0.780	2	5
S.rosmarinus	1.000					2	Inf	-Inf	-Inf	0.000	0	3

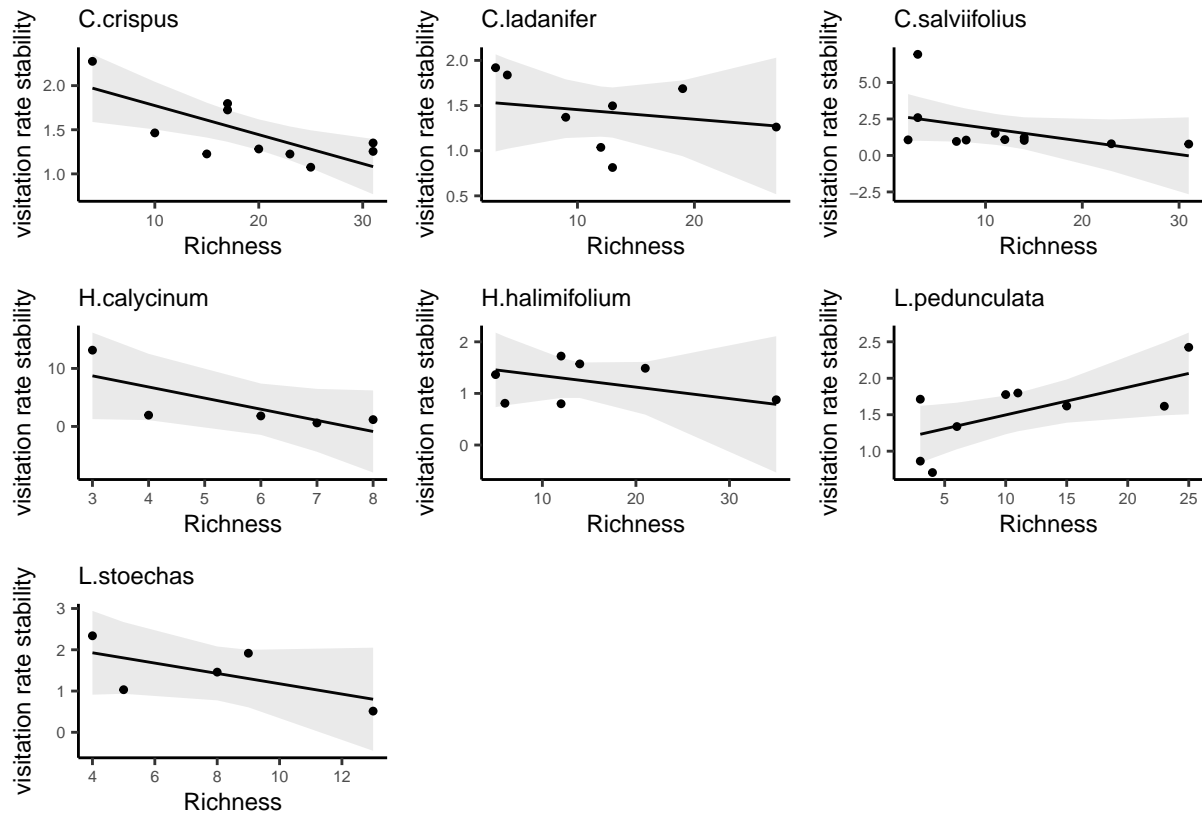


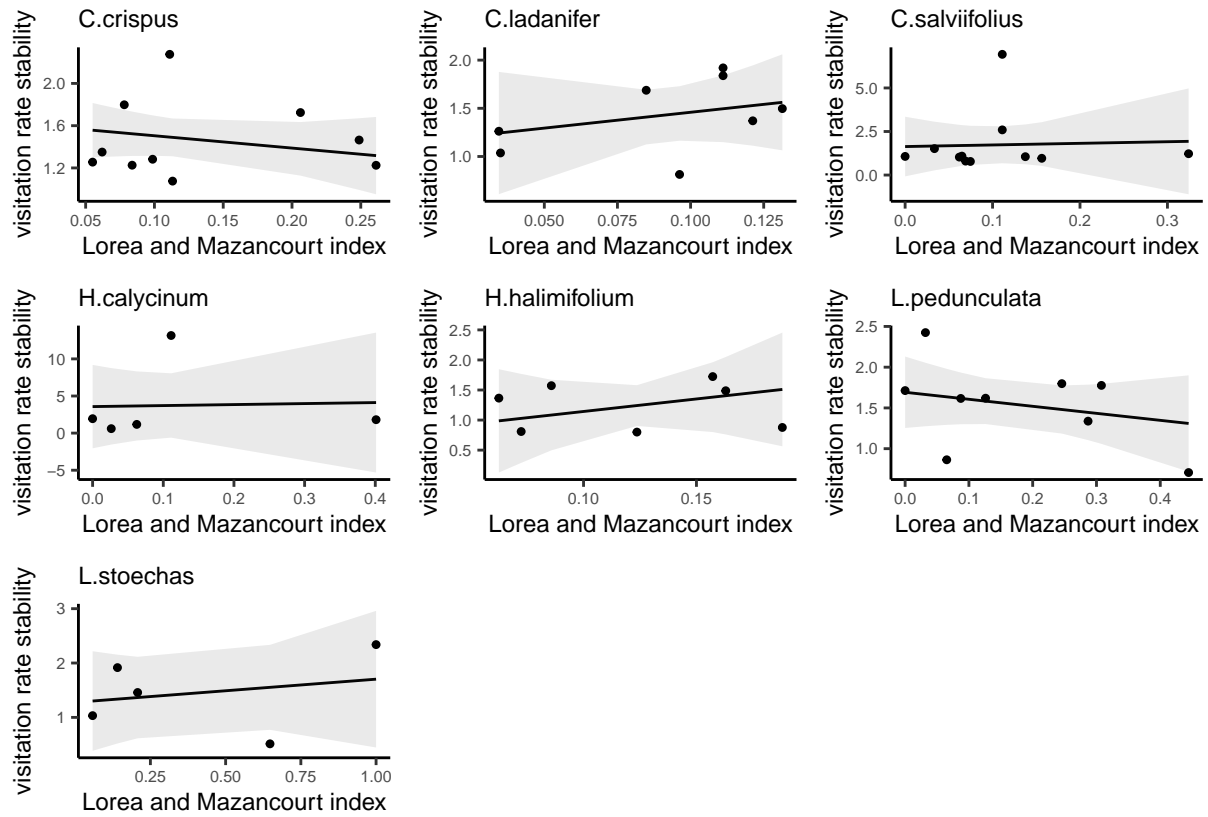


B) richness + Lorea and Mazancourt index

Plant_gen_sp	term	estimate	std.error	statistic	p.value
Cistus crispus	(Intercept)	2.2569	0.3298	6.8439	0.0002
	richness	-0.0329	0.0114	-2.8874	0.0234
	syncLM	-1.1662	1.2733	-0.9159	0.3902
Cistus ladanifer	(Intercept)	1.2632	0.7207	1.7527	0.1400
	richness	-0.0106	0.0248	-0.4300	0.6851
	syncLM	3.2870	5.1894	0.6334	0.5543
Cistus salviifolius	(Intercept)	2.6906	1.1450	2.3499	0.0467
	richness	-0.0907	0.0636	-1.4256	0.1918
	syncLM	0.9221	6.6020	0.1397	0.8924
Halimium calycinum	(Intercept)	14.3175	7.1915	1.9909	0.1847
	richness	-1.9186	1.1920	-1.6096	0.2488
	syncLM	1.3520	15.2134	0.0889	0.9373
Halimium halimifolium	(Intercept)	1.0602	0.5306	1.9982	0.1164
	richness	-0.0223	0.0326	-0.6833	0.5320
	syncLM	4.1646	6.8029	0.6122	0.5735
Lavandula pedunculata	(Intercept)	1.2710	0.3411	3.7260	0.0098
	richness	0.0379	0.0182	2.0861	0.0820
	syncLM	-0.8613	1.0102	-0.8526	0.4266
Lavandula stoechas	(Intercept)	2.2520	0.9818	2.2938	0.1488
	richness	-0.1251	0.1046	-1.1958	0.3543
	syncLM	0.4265	0.9302	0.4585	0.6916
Salvia rosmarinus	(Intercept)	0.7049	0.3299	2.1367	0.1661
	richness	0.0722	0.0664	1.0874	0.3904
	syncLM	0.1143	0.2877	0.3973	0.7295

Plant_gen_sp	r.squared	adj.r.squared	sigma	statistic	p.value	df	logLik	AIC	BIC	deviance	df.residual	nobs
C.crispus	0.544	0.413	0.279	4.169	0.064	2	0.368	7.265	8.475	0.544	7	10
C.ladanifer	0.233	-0.073	0.400	0.761	0.515	2	-2.140	12.279	12.597	0.800	5	8
C.salviifolius	0.204	0.005	1.791	1.026	0.401	2	-20.267	48.533	50.125	25.658	8	11
H. calycinum	0.564	0.129	4.939	1.296	0.436	2	-12.789	33.579	32.017	48.782	2	5
H.halimifolium	0.106	-0.341	0.456	0.237	0.800	2	-2.484	12.969	12.752	0.833	4	7
L.pedunculata	0.547	0.396	0.402	3.620	0.093	2	-2.743	13.486	14.275	0.969	6	9
L.stoechas	0.463	-0.075	0.744	0.861	0.537	2	-3.323	14.646	13.084	1.106	2	5
S.rosmarinus	0.387	-0.227	0.286	0.630	0.613	2	1.455	5.089	3.527	0.164	2	5





We analysed the relationship between fruit proportion stability and visitation rate stability

Plant_gen_sp	term	estimate	std.error	statistic	p.value
Cistus crispus	(Intercept)	7.2785	8.0735	0.9015	0.3936
	cv_1_visitation	-0.6594	5.3552	-0.1231	0.9050
Cistus ladanifer	(Intercept)	26.9268	33.1816	0.8115	0.4626
	cv_1_visitation	-4.8489	25.3316	-0.1914	0.8575
Cistus salviifolius	(Intercept)	28.1162	22.3839	1.2561	0.2558
	cv_1_visitation	-5.8780	16.2812	-0.3610	0.7304
Halimium calycinum	(Intercept)	5.8487			
	cv_1_visitation	-0.2482			
Halimium halimifolium	(Intercept)	5.3543	1.6821	3.1832	0.0245
	cv_1_visitation	-0.7876	1.3077	-0.6022	0.5733
Lavandula pedunculata	(Intercept)	20.1284	6.8967	2.9186	0.0224
	cv_1_visitation	-4.3289	4.2706	-1.0137	0.3445
Lavandula stoechas	(Intercept)	3.1307	5.2635	0.5948	0.5840
	cv_1_visitation	6.7654	1.9306	3.5043	0.0248
Salvia rosmarinus	(Intercept)	41.0082	26.6815	1.5370	0.2641
	cv_1_visitation	-25.9484	24.3382	-1.0662	0.3980

Plant_gen_sp	r.squared	adj.r.squared	sigma	statistic	p.value	df	logLik	AIC	BIC	deviance	df.residual	nobs
C.crispus	0.002	-0.123	5.847	0.015	0.905	1	-30.733	67.465	68.373	273.485	8	10
C.ladanifer	0.009	-0.239	17.872	0.037	0.858	1	-24.597	55.194	54.569	1277.699	4	6
C.salviifolius	0.021	-0.142	25.277	0.130	0.730	1	-36.040	78.080	78.318	3833.414	6	8
H. calycinum	1.000					1	Inf	-Inf	-Inf	0.000	0	2
H.halimifolium	0.068	-0.119	1.263	0.363	0.573	1	-10.387	26.774	26.611	7.970	5	7
L.pedunculata	0.128	0.003	6.246	1.028	0.344	1	-28.127	62.254	62.846	273.089	7	9
L.stoechas	0.754	0.693	7.912	12.280	0.025	1	-19.707	45.415	44.790	250.378	4	6
S.rosmarinus	0.362	0.044	12.098	1.137	0.398	1	-14.262	34.523	32.682	292.726	2	4

