

Combining spatial and phylogenetic eigenvector filtering in trait analyses

Supplementary material

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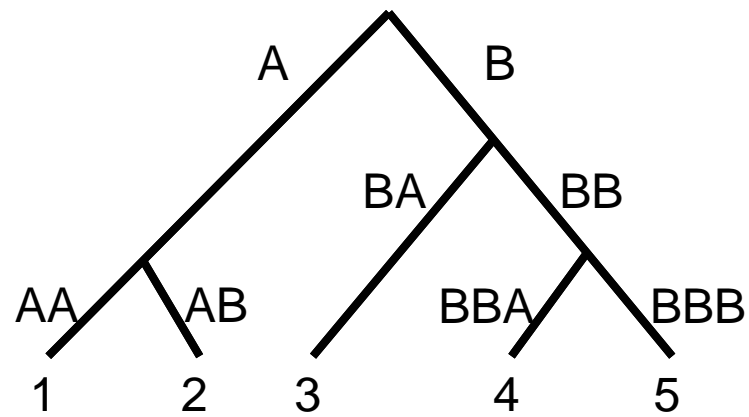
Supplementary Material:

Table S1: Correlation matrix of eigenvectors selected by spatial and spatio-phylogenetic (spatio-phylo) filtering. Absolute values greater than 0.2 are indicated in bold, those smaller than 0.1 in grey.

Filter	spatio-phylo					
	P4	P27	P3	P5	P94	P147
S3	-0.139	-0.093	0.209	0.288	0.039	0.010
S49	-0.085	-0.043	-0.035	0.010	0.071	0.050
S8	0.081	-0.005	-0.095	-0.017	-0.097	0.012
S35	-0.081	-0.037	-0.075	0.046	-0.089	-0.044
spatial S57	0.080	-0.022	-0.053	0.070	-0.134	0.020
S10	0.023	0.007	0.052	-0.035	0.065	-0.010
S40	0.045	0.061	-0.044	-0.002	-0.003	0.018
S51	0.075	-0.100	0.051	0.084	-0.101	0.062
S17	-0.024	-0.066	-0.085	-0.074	-0.033	0.020

Table S2: Correlation matrix of eigenvectors for combining spatial and spatially structured phylogenetic (spatio-phylo) filters in one model (both). Due to the lacking correlations between orthogonal spatial or orthogonal spatio-phylogenetic filters, these values are not shown. Absolute values smaller than 0.1 in grey.

		spatio-phylo			
Filter		P32	P45	P4	P27
spatial	S3	-0.178	0.050	-0.139	-0.093
	S35	0.046	-0.020	-0.081	-0.037



Species\Branch	A	AA	AB	B	BA	BB	BBA	BBB
Species 1	1	1	0	0	0	0	0	0
Species 2	1	0	1	0	0	0	0	0
Species 3	0	0	0	1	1	0	0	0
Species 4	0	0	0	1	0	1	1	0
Species 5	0	0	0	1	0	1	0	1

Figure S1: Representation of a binary phylogenetic tree in a species by phylogenetic branch matrix, using phylogenies in CAIC format, i.e. different letters represents different branches at each node.

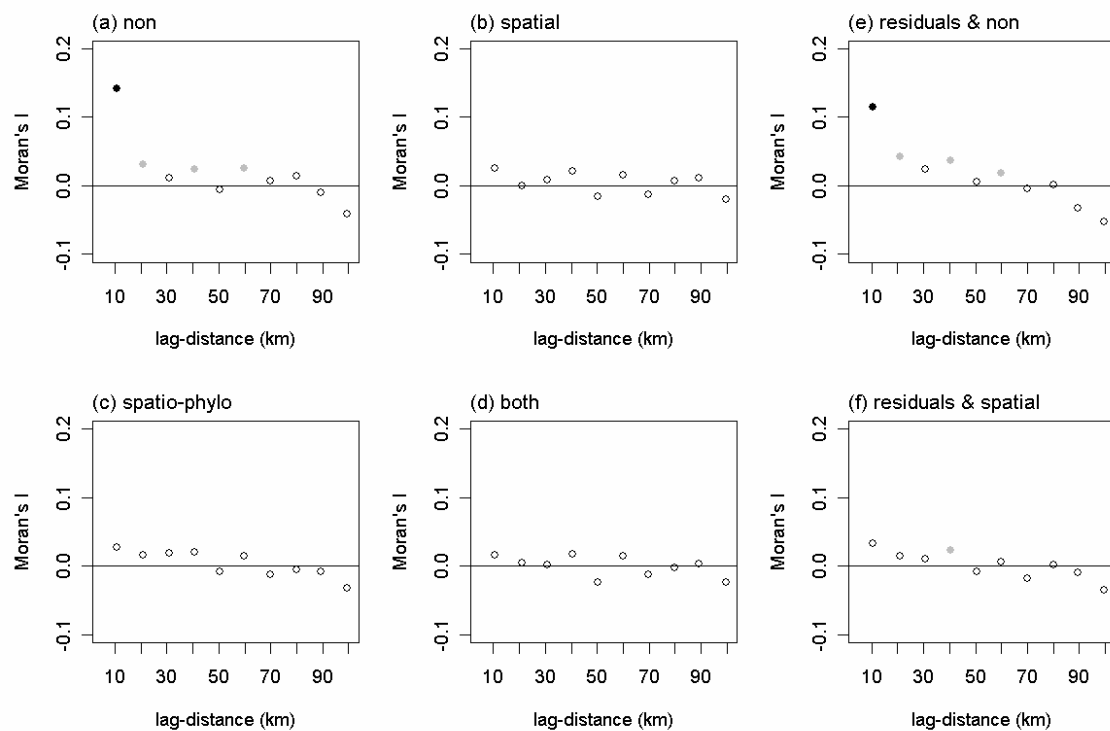


Figure S2 Moran's I correlograms of residual autocorrelation of the different models explaining average onset of flowering in Switzerland: no filters (a), spatial filters (b), spatially structured phylogenetic filters (c), both filters simultaneously (d), residuals of pure phylogenetic filters on the traits (e) and sequential phylogenetic and spatial filtering (f); see methods for details. Significant coefficients are depicted as closed circles ($P < 0.05$; in black after Bonferroni correction, in grey without correction), insignificant autocorrelation as open circles.

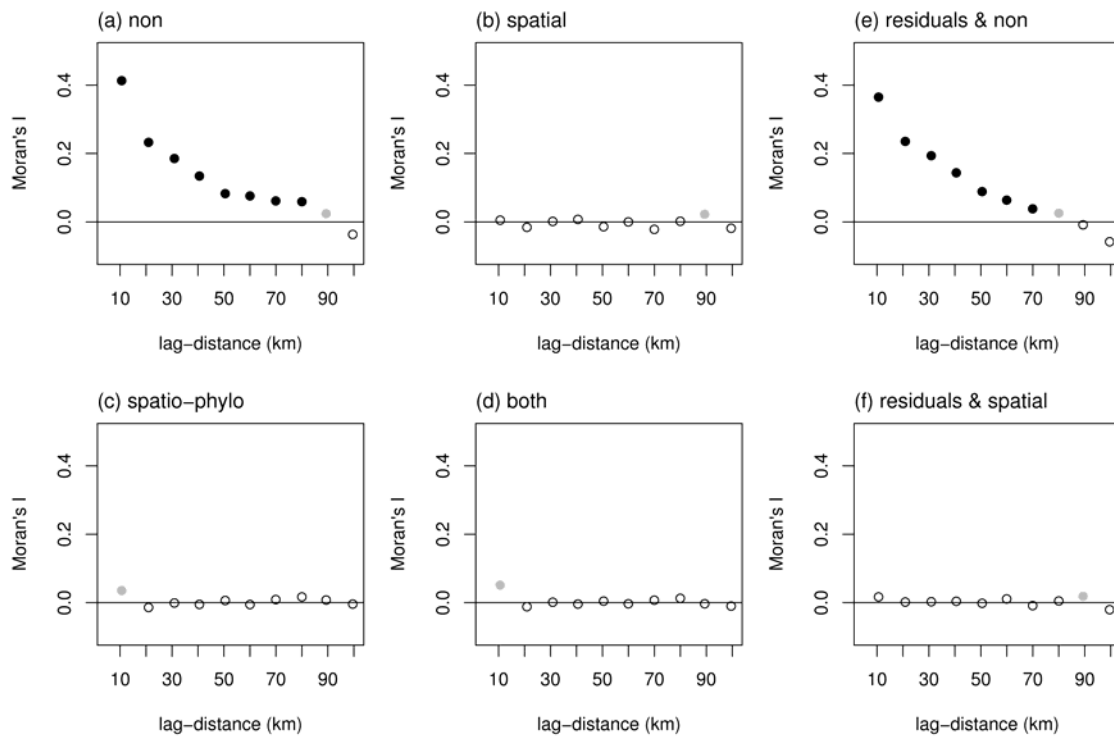


Figure S3 Moran's I correlograms of residual autocorrelation of the different models explaining average onset of flowering in Switzerland as in Fig. S1, but excluding calcareous substrate from the predictors: no filters (a), spatial filters (b), spatially structured phylogenetic filters (c), both filters simultaneously (d), residuals of pure phylogenetic filters on the traits (e) and sequential phylogenetic and spatial filtering (f); see methods for details.