Ecography

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Supplementary material

Appendix 1

Table A1. Models containing precipitation-change velocity between the LGM and the present, contemporary climate, species richness and insularity as predictors of modularity in pollination networks. The standardized regression coefficients and their significance level are reported for ordinary least squares (OLS) regression and spatial eigenvector mapping (SEVM) modelling, and reported for both an averaged model based on weighted w_i and minimum adequate models (MAMs) (Diniz-Filho et al. 2008). We also give AIC_c, Moran's I, and coefficients of determination (R^2) from partial regression models separating the effect of temperature-change velocity from the effect of the other predictors (Rangel et al. 2010). $R^2_{\text{total velocity}}$ describes total variation explained by velocity, and $R^2_{\text{only velocity}}$ reflects the unique variation explained by velocity. The analysis was conducted both for the global dataset (n = 54), and separately for mainland (n = 23) and island networks (n = 31).

	Global				Mainland				Islands			
	OLS		SEVM		OLS		SEVM		OLS		SEVM	
	Averaged	MAM	Averaged	MAM[†]	Averaged	MAM[$]	Averaged	MAM[£]	Averaged	MAM[¶]	Averaged	MAM[§]
Velocity	-0.05	–	+0.04	–	-0.06	–	-0.05	–	-0.16	–	-0.19	–
$Velocity^2$	+0.06	–	+0.14	–	+0.20	$+0.20^{NS}$	+0.24	$+0.23^{NS}$	-0.08	–	-0.07	–

MAP	+0.32	+0.32*	-0.01	–	+0.18	–	-0.05	–	+0.29	–	+0.26	–
MAT	+0.15	–	+0.03	–	+0.16	–	+0.04	–	+0.30	+0.31*	+0.38	+0.34*
Species richness	+0.31	+0.29*	+0.30	+0.31*	-0.01	–	+0.18	–	+0.55	+0.60*	+0.48	+0.46^{NS}
Insularity	-0.06	–	-0.08	–								
AIC_c		-111.12		-138.37		-38.88		-48.57		-69.15		-67.02
Moran's I		≤0.32*		≤0.03^{NS}		≤0.56*		≤0.23^{NS}		≤0.12^{NS}		≤0.14^{NS}
R^2		0.23		0.53		0.04		0.45		0.44		0.45
$R^2_{\text{total velocity}}$		0.00		0.00		0.04		0.04		0.00		0.00
$R^2_{\text{only velocity}}$		0.00		0.00		0.04		0.04		0.00		0.00

*$P < 0.05$, ^{NS} $P > 0.05$. †One model was equally fit (i.e. $\Delta AIC_c \leq 2$) containing the variables: velocity^2, species richness, spatial filter. $Four other models had $\Delta AIC_c \leq 2$: 1) velocity; 2) MAP; 3) MAT; 4) species richness. £One other model had $\Delta AIC_c \leq 2$: species richness, spatial filter. ¶Three other models had $\Delta AIC_c \leq 2$: 1) MAP, species richness; 2) velocity, MAT, species richness; 3) MAP, MAT, species richness.

[§]Three other models had $\Delta AIC_c \leq 2$: 1) velocity, MAT, species richness, spatial filter; 2) MAP, species richness, spatial filter; 3) MAT, spatial filter.

Table A2. Models containing maximum temperature-change velocity of 1000 year time intervals, contemporary climate, species richness and insularity as predictors of modularity in pollination networks. The standardized regression coefficients and their significance level are reported for ordinary least squares (OLS) regression and spatial eigenvector mapping (SEVM) modelling, and reported for both an averaged model based on weighted w_i and minimum adequate models (MAMs) (Diniz-Filho et al. 2008). We also give AIC_c, Moran's I, and coefficients of determination (R^2) from partial regression models separating the effect of temperature-change velocity from the effect of the other predictors (Rangel et al. 2010). $R^2_{\text{total velocity}}$ describes total variation explained by velocity, and $R^2_{\text{only velocity}}$ reflects the unique variation explained by velocity. The analysis was conducted both for the global dataset (n = 54), and separately for mainland (n = 23) and island networks (n = 31).

	Global				Mainland				Islands			
	OLS		SEVM		OLS		SEVM		OLS		SEVM	
	Averaged	MAM[†]	Averaged	MAM	Averaged	MAM[$]	Averaged	MAM[£]	Averaged	MAM[¶]	Averaged	MAM[§]
Velocity	-0.23	–	-0.03	–	-0.68	-0.72*	-0.28	–	+0.18	–	+0.10	–
Velocity^2	-0.52	-0.48*	-0.14	–	-0.59	–	-0.48	-0.38*	-0.39	–	-0.37	–
MAP	+0.32	+0.31*	+0.02	–	+0.40	+0.42*	+0.25	–	+0.28	–	+0.26	–

MAT	+0.02	–	+0.03	–	+0.14	–	+0.09	–	+0.26	+0.31*	+0.33	+0.34*
Species richness	+0.22	+0.19^{NS}	+0.30	+0.31*	-0.17	–	+0.05	–	+0.52	+0.60*	+0.47	+0.46^{NS}
Insularity	-0.33	-0.33*	-0.15	–								
AIC_c		-118.12		-138.37		-51.58		-50.87		-69.15		-67.02
Moran's I		≤0.24*		≤0.03^{NS}		≤0.14^{NS}		≤0.15^{NS}		≤0.12^{NS}		≤0.14^{NS}
R^2		0.38		0.53		0.52		0.50		0.44		0.45
$R^2_{\text{total velocity}}$		0.17		0.00		0.35		0.36		0.00		0.00
$R^2_{\text{only velocity}}$		0.15		0.00		0.35		0.11		0.00		0.00

*$P < 0.05$, ^{NS} $P > 0.05$. †Three models were equally fit (i.e. $\Delta AIC_c \leq 2$) containing the variables: 1) velocity^2, MAP, insularity; 2) velocity, MAP, species richness, insularity; 3) velocity, MAP, insularity. $^{\$}$One other model had $\Delta AIC_c \leq 2$: velocity^2, MAP. $^{£}$Three other models had $\Delta AIC_c \leq 2$: 1) velocity, spatial filter; 2) velocity^2, MAP, spatial filter; 3) velocity, MAP, spatial filter. ¶Three other models had $\Delta AIC_c \leq 2$: 1) MAP, species richness; 2) velocity^2, species richness; 3) MAP, MAT, species richness. §Three other models had $\Delta AIC_c \leq 2$: 1) MAP, species richness, spatial filter; 2) MAT, spatial filter; 3) velocity^2, species richness, spatial filter.

Table A3. Models containing maximum precipitation-change velocity of 1000 year time intervals, contemporary climate, species richness and insularity as predictors of modularity in pollination networks. The standardized regression coefficients and their significance level are reported for ordinary least squares (OLS) regression and spatial eigenvector mapping (SEVM) modelling, and reported for both an averaged model based on weighted w_i and minimum adequate models (MAMs) (Diniz-Filho et al. 2008). We also give AIC_c, Moran's I, and coefficients of determination (R^2) from partial regression models separating the effect of temperature-change velocity from the effect of the other predictors (Rangel et al. 2010). $R^2_{\text{total velocity}}$ describes total variation explained by velocity, and $R^2_{\text{only velocity}}$ reflects the unique variation explained by velocity. The analysis was conducted both for the global dataset (n = 54), and separately for mainland (n = 23) and island networks (n = 31).

	Global				Mainland				Islands			
	OLS		SEVM		OLS		SEVM		OLS		SEVM	
	Averaged	MAM[†]	Averaged	MAM	Averaged	MAM[$]	Averaged	MAM[£]	Averaged	MAM[¶]	Averaged	MAM[§]
Velocity	+0.38	–	-0.03	–	+0.08	–	-0.07	–	-0.01	–	+0.14	–
$Velocity^2$	-0.61	-0.40[*]	-0.18	–	-0.85	-0.44[*]	-0.47	-0.31[NS]	-0.38	-0.35[*]	-0.46	-0.36[*]

MAP	+0.34	+0.31*	+0.02	–	+0.31	–	+0.09	–	+0.24	–	+0.23	–
MAT	+0.09	–	+0.03	–	+0.26	–	+0.11	–	+0.20	–	+0.27	–
Species richness	+0.27	+0.23^{NS}	+0.30	+0.31*	-0.26	–	+0.09	–	+0.55	+0.58*	+0.44	+0.49*
Insularity	-0.31	-0.32*	-0.19	–								
AIC_c		-113.23		-138.37		-42.77		-50.28		-70.62		-68.10
Moran's I		≤0.37*		≤0.03^{NS}		≤0.43^{NS}		≤0.12^{NS}		≤0.23^{NS}		≤0.25^{NS}
R^2		0.32		0.53		0.19		0.49		0.46		0.47
$R^2_{\text{total velocity}}$		0.09		0.00		0.19		0.19		0.12		0.12
$R^2_{\text{only velocity}}$		0.09		0.00		0.19		0.09		0.12		0.12

*P < 0.05, ^{NS} P > 0.05. †Four models were equally fit (i.e. $\Delta AIC_c \leq 2$) containing the variables: 1) velocity, velocity^2, MAP, insularity; 2) velocity^2, MAP, insularity; 3) velocity, velocity^2, MAP, species richness, insularity; 4) velocity^2, MAP, species richness. $Ten other models had $\Delta AIC_c \leq 2$: 1) velocity^2, MAP; 2) velocity; 3) velocity^2, MAT; 4) velocity, MAP; 5) velocity^2, MAT, species richness; 6) velocity^2, species richness; 7) velocity, MAT; 8) velocity, velocity^2, MAP; 9) velocity, species richness; 10) velocity^2, MAP, species richness. £One

other model had $\Delta AIC_c \leq 2$: velocity, spatial filter. [¶]Five other models had $\Delta AICc \leq 2$: 1) velocity^2, MAP, species richness; 2) MAT, species richness; 3) velocity^2, MAT, species richness; 4) MAP, species richness; 5) velocity, species richness. [§]Four other models had $\Delta AICc \leq 2$: 1) MAT, species richness, spatial filter; 2) velocity^2, MAT, species richness, spatial filter; 3) velocity^2, MAP, species richness, spatial filter; 4) MAP, species richness, spatial filter.

Table A4. Models containing precipitation-change velocity between the LGM and the present, contemporary climate, species richness and insularity as predictors of nestedness in pollination networks. The standardized regression coefficients and their significance level are reported for ordinary least squares (OLS) regression and spatial eigenvector mapping (SEVM) modelling, and reported for both an averaged model based on weighted w_i and minimum adequate models (MAMs) (Diniz-Filho et al. 2008). We also give AIC_c, Moran's I, and coefficients of determination (R^2) from partial regression models separating the effect of temperature-change velocity from the effect of the other predictors (Rangel et al. 2010). $R^2_{\text{total velocity}}$ describes total variation explained by velocity, and $R^2_{\text{only velocity}}$ reflects the unique variation explained by velocity. The analysis was conducted both for the global dataset (n = 54), and separately for mainland (n = 23) and island networks (n = 31).

	Global				Mainland				Islands			
	OLS		SEVM		OLS		SEVM		OLS		SEVM	
	Averaged	MAM[†]	Averaged	MAM[$]	Averaged	MAM[£]	Averaged	MAM	Averaged	MAM[¶]	Averaged	MAM[§]
Velocity	+0.08	–	+0.03	–	+0.13	–	+0.08	–	+0.03	–	+0.05	–
$Velocity^2$	+0.07	–	+0.03	–	+0.04	–	-0.01	–	+0.19	$+0.19^{NS}$	+0.18	$+0.19^{NS}$
MAP	-0.27	-0.25^{*}	-0.11	–	-0.24	–	-0.10	–	-0.37	-0.38^{*}	-0.35	-0.37^{*}

MAT	-0.06	–	+0.02	–	-0.04	–	+0.07	–	-0.02	–	-0.13	–
Species richness	-0.66	-0.66*	-0.72	-0.73*	-0.66	-0.65*	-0.82*	-0.82*	-0.62	-0.61*	-0.56	-0.57*
Insularity	+0.12	–	+0.05	–								
AIC_c		-16.88		-28.42		0.47		-9.4		-10.94		-7.97
Moran's I		≤0.19*		≤0.04^{NS}		≤0.72*		≤0.10^{NS}		≤0.10^{NS}		≤0.10^{NS}
R^2		0.57		0.65		0.43		0.67		0.69		0.69
$R^2_{\text{total velocity}}$		0.00		0.00		0.00		0.00		0.01		0.01
$R^2_{\text{only velocity}}$		0.00		0.00		0.00		0.00		0.01		0.01

*$P < 0.05$, ^{NS} $P > 0.05$. †Three models were equally fit (i.e. $\Delta AIC_c \leq 2$) containing the variables: 1) MAP, species richness, insularity; 2) velocity^2, MAP, species richness; 3) velocity, MAP, species richness. $One other model had $\Delta AIC_c \leq 2$: MAP, species richness, spatial filter. £One other model had $\Delta AIC_c \leq 2$: MAP, species richness. ¶One other model had $\Delta AIC_c \leq 2$: MAP, species richness. §One other model had $\Delta AIC_c \leq 2$: MAP, species richness, spatial filter.

Table A5. Models containing maximum temperature-change velocity of 1000 year time intervals, contemporary climate, species richness and insularity as predictors of nestedness in pollination networks. The standardized regression coefficients and their significance level are reported for ordinary least squares (OLS) regression and spatial eigenvector mapping (SEVM) modelling, and reported for both an averaged model based on weighted w_i and minimum adequate models (MAMs) (Diniz-Filho et al. 2008). We also give AIC_c, Moran's I, and coefficients of determination (R^2) from partial regression models separating the effect of temperature-change velocity from the effect of the other predictors (Rangel et al. 2010). $R^2_{\text{total velocity}}$ describes total variation explained by velocity, and $R^2_{\text{only velocity}}$ reflects the unique variation explained by velocity. The analysis was conducted both for the global dataset (n = 54), and separately for mainland (n = 23) and island networks (n = 31).

	Global				Mainland				Islands			
	OLS		SEVM		OLS		SEVM		OLS		SEVM	
	Averaged	MAM[†]	Averaged	MAM[$]	Averaged	MAM[£]	Averaged	MAM	Averaged	MAM	Averaged	MAM
Velocity	-0.12	–	-0.11	–	+0.36	+0.43[*]	-0.09	–	-0.13	–	-0.09	–
$Velocity^2$	+0.40	+0.27[*]	+0.11	–	+0.40	–	+0.15	–	+0.01	–	+0.02	–
MAP	-0.26	-0.26[*]	-0.11	–	-0.32	-0.34[*]	-0.11	–	-0.37	-0.34[*]	-0.35	-0.34[*]

MAT	-0.00	–	+0.02	–	-0.02	–	+0.08	–	-0.04	–	-0.16	–
Species richness	-0.61	-0.59*	-0.72	-0.73*	-0.59	-0.61*	-0.82	-0.82*	-0.63	+0.61*	-0.55	-0.54*
Insularity	+0.24	+0.25*	+0.06	–								
AIC_c		-19.57		-28.42		-3.71		-9.38		-10.46		-7.92
Moran's I		$\leq 0.06^{NS}$		$\leq 0.04^{NS}$		$\leq 0.14^{NS}$		$\leq 0.10^{NS}$		$\leq 0.05^{NS}$		$\leq 0.04^{NS}$
R^2		0.62		0.65		0.64		0.67		0.65		0.65
$R^2_{\text{total velocity}}$		0.08		0.00		0.22		0.00		0.00		0.00
$R^2_{\text{only velocity}}$		0.05		0.00		0.16		0.00		0.00		0.00

*$P < 0.05$, ^{NS} $P > 0.05$. †Two models were equally fit (i.e. $\Delta AIC_c \leq 2$) containing the variables: 1) velocity, velocity^2, MAP, species richness, insularity; 2) velocity, MAP, species richness, insularity. $^{\$}$One other model had $\Delta AICc \leq 2$: MAP, species richness, spatial filter. £Two other models had $\Delta AIC_c \leq 2$: 1) velocity^2, MAP, species richness; 2) velocity^2, species richness.

Table A6. Models containing maximum precipitation-change velocity of 1000 year time intervals, contemporary climate, species richness and insularity as predictors of nestedness in pollination networks. The standardized regression coefficients and their significance level are reported for ordinary least squares (OLS) regression and spatial eigenvector mapping (SEVM) modelling, and reported for both an averaged model based on weighted wi and minimum adequate models (MAMs) (Diniz-Filho et al. 2008). We also give AICc, Moran's I, and coefficients of determination (R2) from partial regression models separating the effect of temperature-change velocity from the effect of the other predictors (Rangel et al. 2010). R2total velocity describes total variation explained by velocity, and R2only velocity reflects the unique variation explained by velocity. The analysis was conducted both for the global dataset (n = 54), and separately for mainland (n = 23) and island networks (n = 31).

	Global				Mainland				Islands			
	OLS		SEVM		OLS		SEVM		OLS		SEVM	
	Averaged	MAM[†]	Averaged	MAM[$]	Averaged	MAM[£]	Averaged	MAM	Averaged	MAM	Averaged	MAM
Velocity	+0.02	–	+0.04	–	+0.13	–	-0.01	–	+0.06	–	+0.06	–
Velocity^2	+0.21	–	-0.00	–	+0.35	–	+0.04	–	+0.05	–	+0.08	–

MAP	-0.26	-0.25*	-0.11	–	-0.24	–	-0.09	–	-0.34	-0.34*	-0.33	-0.34*
MAT	-0.04	–	+0.02	–	-0.08	–	+0.08	–	-0.02	–	-0.14	–
Species richness	-0.65	-0.66*	-0.72	-0.73*	-0.60	-0.65*	-0.82	-0.82*	-0.63	-0.61*	-0.55	-0.54*
Insularity	+0.19	–	+0.06	–								
AIC_c		-16.88		-28.42		+0.47		-9.38		-10.46		-7.92
Moran's I		≤0.19*		≤0.04NS		≤0.72*		≤0.10NS		≤0.05NS		≤0.04NS
R^2		0.57		0.65		0.43		0.67		0.65		0.65
$R^2_{\text{total velocity}}$		0.00		0.00		0.00		0.00		0.00		0.00
$R^2_{\text{only velocity}}$		0.00		0.00		0.00		0.00		0.00		0.00

*$P < 0.05$, NS $P > 0.05$. †Three models were equally fit (i.e. $\Delta AIC_c \leq 2$) containing the variables: 1) velocity^2, MAP, species richness, insularity; 2) MAP, species richness, insularity; 3) velocity, MAP, species richness, insularity. $One other model had $\Delta AIC_c \leq 2$: MAP, species richness, spatial filter. £Four other models had $\Delta AIC_c \leq 2$: 1) velocity, species richness; 2) velocity^2, species richness; 3) MAP, species richness; 4) velocity^2, MAP, species richness.